

COMPUTERWORLD

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The IBM 2770 data communications system, which can transmit and receive data using a variety of input and output devices, is shown with a card reader (upper right), display station, and printer.

IBM 360-Compatible RPG Comes With New GE-120

PHOENIX — People using or contemplating IBM's 360s or Univac's 9000 Series have a new manufacturer to look at for RPG. In announcing their fourth 100 Series processor, the GE-120, GE noted that they have a 360-compatible RPG. This could also be easily made compatible with Univac's language.

The 100 Series already has an extensive line of software, with tape, disk, and mixed operating systems, Cobol, Fortran, and a number of problem-oriented packages in the mathematical and engineering areas.

The company has applications packages covering parts explosion and random-access inventory control and expects that the new processor will find a place in distribution, hospital administration, insurance, banking, and retailing. A company spokesman was "not at liberty to say" whether the last five areas are represented by specific packages.

Prices of typical configurations include \$2,980 per month for a 12K processor (cycle time 4 μ sec); 3 magnetic tapes (15,000 bits/sec); a 400-cards/min reader; and a 300-lines/min printer. A disk configuration, also 12K, with two DSU-160s (15,000,000 characters of storage) is priced to rent for \$1,500 per month.

RPG package is said to be

fully compatible with IBM's and, therefore, very close to Univac's. A GE spokesman described it as being upward compatible (to the GE-130) but not downward (to the 105 and 115). It will be released in tape and disk versions.

The 120 processor has a delivery time of six months.

New 66 Char/Sec Serial Printer, Other IBM I/O Units Announced

WHITE PLAINS, N.Y. — Now that the world has had some time to react to unbundling, IBM has given it some new products to consider.

- The 2770 is a new modular terminal with various combinations of paper tape, cards, magnetic tape cartridges, a keyboard, a new MICR unit, visual display, and a new 66 char/sec serial printer.

- The 2790 data communications system provides two-way communications between a large number of data collection stations and a central processor. It can be adapted to either most models of the 360 or to the 1800.

- The 2981 is a special-order alphanumeric keyboard for entry of data and inquiries into a 360 equipped with computer-compiled audio response.

- The 1800 has been beefed up with more core, more data channels, 2311 disk capability, and much-expanded communications. Also for the 1800 is an adapter for binary synchronous communications and a 2790 adapter.

2770 Modular Terminal

The major news in this subsystem appears to be the serial printer, which operates at speeds up to 66 char/sec.

The 2770 can handle various combinations of cards, paper tape, keyboard input, magnetic tape cartridges from the Model 50 inscriber, a new MICR unit, and the new printer. A system consisting of control unit and

keyboard, card reader, and printer will rent for about \$600 per month with a purchase price of about \$26,000, IBM said.

The new unit uses binary synchronous transmission. It can communicate with another 2770 or, controlled by any 360 larger than the Model 20, can operate on the same line with the 2780 terminal, an 1130 processor, or a Model 20.

It transmits over a telephone

line at up to 2,400 bits/sec.

First deliveries are scheduled for the second quarter of 1970.

2790 Communications System

This is a multipoint data collection and dissemination system said to be capable of connecting over 1,000 remote work stations to a central 360 (most models) or an 1800.

Data is entered either at an

(Continued on Page 4)

90% Program Conversion Claimed by New Service

NEW YORK — A new service that will convert 1401 Autocoder or 7074 Cobol into 360/DOS Assembly Language or OS Cobol, respectively, is now available. Maximum cost is 60 cents per statement. "The Total-Tran package can convert, or at least flag on the listing, 100% of the statements in any Autocoder program," according to Peter D. Colgan, president of CPU Management Advisory Corp. "The program will convert at least 90% and usually 98% of the statements directly," he continued.

Allows New Source Labels

Total-Tran allows the user to determine what statement and data labels he would like to use, and the de-assembler, which translates the 1401 object program into Autocoder, produces

the desired labels. The program can handle overlays, work-mark manipulation, op-code switching, and most other program tricks.

Some Limitations

Certain types of programming tricks cannot be translated. Specifically: address constants, word-mark bounded operations, and chaining of work-mark bounded instructions, such as ADD. However, all of these types of problems are flagged on the output listing, allowing the programmer at CPU to correct them immediately.

Advantage of a Service

The price starts at 60 cents per statement and decreases to 15 cents per statement for each additional 500 statements after the first 500 and includes complete translation service. This includes de-assembling the current object program into Autocoder, translating the Autocoder into DOS Assembly Language, and then making the necessary corrections to produce a complete working program, ready for immediate running.

The specific types of tricks that Tony Donato, the programmer and codeveloper of Total-Tran, discussed with CW

(Continued on Page 4)

Is Fraud Possible?

Computerized Voting Under Investigation

LOS ANGELES — An investigation into the possibility that fraud could be committed with computerized voting has been ordered by the Los Angeles County Board of Supervisors. No one has suggested that it has already occurred.

The county uses the IBM Votomatic system, which has been plagued by controversy since its inception. Critics charge that it is possible to rig elections with the system. Under the system, voters hand-punch cards that then become direct input.

The board of supervisors called for the investigation at its July 8 meeting and is expected to name the five members of the blue-ribbon commission at its next meeting. Each supervisor will name one "business leader in the community" to the panel; no

computer professionals are expected to be named. But Registrar-Recorder Ray E. Lee noted that the commission could hire computer experts if it wished.

Phyllis Huggins, editor and publisher of *Computing Newsline*, a newsletter that several times has stressed the possibility of rigging and fraud, charged that the new commission will "probably be just a whitewash anyway." She noted that a similar blue-ribbon commission that picked the voting system in the first place had only one technician on it, "and he objected."

In a separate action, the Los Angeles County Democratic Central Committee has asked for additional controls on the system. It wants the right to inspect the program and to watch all

steps of the vote tabulation.

Action on computerized voting has also occurred on three other fronts in California:

- U.S. Sen. George Brown called on the California State Assembly to investigate computerized voting.

- The ABC television network is making a documentary on the subject.

- A group of state legislators is sending 10,000 reprints of the *Computing Newsline* articles to city clerks, mayors, and governors throughout the country.

The board of supervisors acted after an article appeared in the *Los Angeles Times* charging that fraud was possible. Recently six local computer experts declared it was possible to rig the ma-

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Computerized Decision-Making Poses Threat: Gallagher

WASHINGTON, D.C. — "A basic contention of computer-oriented planning is that the nature of man is infinitely malleable and that the individual can be made to adapt to any mold deemed suitable for him," declared Rep. Cornelius E. Gallagher (D-N.J.) in a speech before the Association for Computing Machinery's Technical Symposium here.

He cited two particular threats caused by computer-oriented planning. One was invasion of privacy and the other, com-

puterized decision-making.

All animals have a buffer zone that cannot be intruded upon, warned Gallagher. In lower animals, it is called a Territorial Imperative, and Gallagher declared that for man it is an Intellectual Imperative. He described this as a "space of psychological control that permits ideas to be discussed freely within this territory and with the guarantee that strict public accountability will not follow."

But Gallagher charged that through invasions of privacy,

"the advance of computer and other technologies threatens the Intellectual Imperative. Physically, we are constantly in a crowd; intellectually, technology has provided devices to make our forgotten actions and our unacknowledged thoughts known to the crowd."

Computerized Decision-Making

Computerized information systems for decision-making may lessen the influence of individuals, warned Gallagher. He quoted Dr. Alan Westin that, "There is a dangerous arrogance that can be built up when a small group of people believe that they have the language, the system, and the most scientific way of making decisions. Failure to keep popular participation in public decision-making, and the

developing mixture of private and public decision-making in our society creates a dangerous impersonality."

Gallagher noted that rather than accepting less participation in decision-making, "articulate and aggressive segments of our society are insisting upon the right to influence and alter decisions that vitally affect them. Blacks, hippies, students, ghetto parents, and members of the

dissenting academy may seem like a wildly disparate group, but they are united in one thing. They all demand a greater piece of the decision-making action."

In response to this, Gallagher suggested that two questions be explored: "Can machine-based data systems assist in decentralizing decision-making? Is it possible for individuals who are not technologically sophisticated to interface with the data flow?"

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Data Strips on Passport Called Threat to Privacy

MONTREAL — A machine-readable passport has been sug-

gested to speed international air travelers on their way, but it has come under attack as a system that would lead to data banks and invasions of privacy.

The credit-card-size passport would have the person's picture on the front with the usual information about him in normal lettering. On the back of the passport, there would be magnetic strips containing machine-readable information that would not be man-readable.

Supporters of the new passport claim that it would speed-up the processing of passengers at international airports because the card could be inserted in a machine that would automatically read the information on the back, make changes as necessary, and approve or reject the traveler.

Critics have warned that travelers would have no way of knowing what information was contained on the magnetic strips on the card, and that such information could be inaccurate or derogatory.

Also, they said, the system would make it easy to record movements of travelers and to build up dossiers.

Finally, critics charge, it would be easy to connect the automatic passport readers to central computers and data banks so that a person's movements could be recorded, and so that airport customs and immigration officials could screen people based on information in the data bank unknown to the traveler.

The new passport was one of several proposed at a meeting of members of the International Civil Aviation Organization, an affiliate of the United Nations. Observers at the meeting included representatives of Interpol (International Criminal Police Organization).

The aviation organization is particularly concerned that jumbo jets, such as the Boeing 747 carrying 360 passengers, will further overload customs and immigration facilities.

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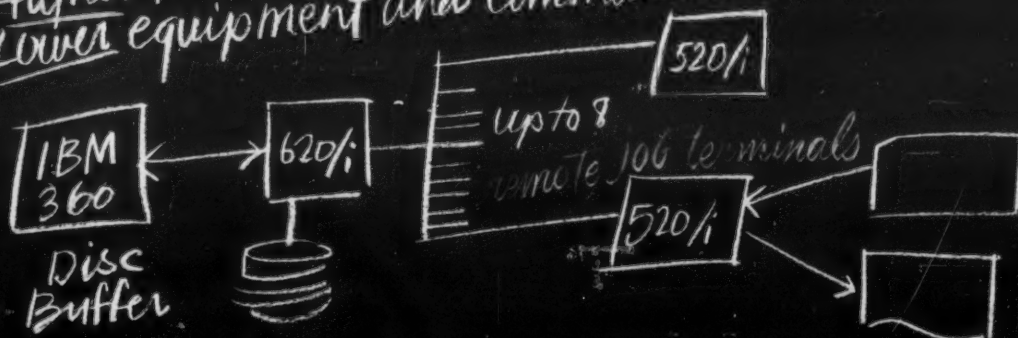
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existing programs, operating procedures or hardware.

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New IBM I/O Units Announced

(Continued from Page 1)
entry station (for punched card or badge input) or at an area station, which is the point of collection for a number of entry units and the output point for printed information. A system may consist of up to 100 area stations.

The 2715 controller is central to the entire system. It can, in its basic form, control 64 area stations, 4 area stations and 120 entry units, IBM said.

Prices will obviously vary widely, depending on customer needs and will run between \$3,500 and \$7,000 per month in typical

configurations. For about \$5,000 per month, the user can have 50 entry units, 10 area stations, and a controller.

This is a special-order device, designed to allow entry of alphanumeric information and inquiries into an audio response system, with computer-compiled spoken responses.

The character set includes 26 letters in alphabetical order and 22 numbers and special characters.

The 2981 parallel-tone alphanumeric keyboard rents for \$20 per month or can be purchased for \$800.

Core memory can be expanded, in 8K increments, to 65K or 16-bit words. Each additional 8K rents for \$585 per month or can be purchased for \$17,460.

Up to eight 2311 disk drives can be attached to a selector channel that has a rental price of \$315 per month or may be



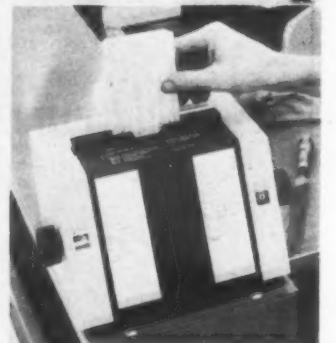
Area station for 2790

purchased for \$12,610.

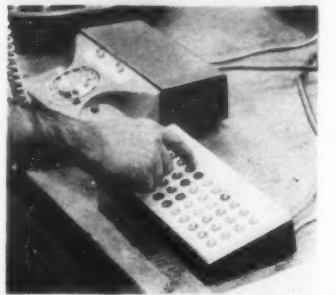
Six data channels may be added (for a total of 15). The channel expansion can be rented for \$63 per month or is available for purchase at \$2,520.

The 1800/2790 adapter costs \$630 per month (purchase price, \$25,220).

The binary synchronous communications adapter will rent for \$223 per month, with a purchase price of \$12,610, and each line will require its own adapter that will cost \$165 a month or \$6,595 if purchased.



Data entry unit for 2790



2981 keyboard

Special 'Bundled' Package Is Offered by Burroughs

DETROIT — Burroughs, which announced June 23 that it would offer an optional unbundling plan to its customers, has been quietly offering a special "bundle" deal to prospective customers since May, CW learned last week.

Prospective purchasers of the newer 2500, 3500, and 6500 systems are being offered a five-year guarantee against separate pricing.

Also being offered are special three- and five-year leases that carry guarantees against separate pricing plus discounts of about 7% and 11%, respectively. These leases include unlimited monthly use, although 100-hr/mo contracts also are available.

These processors formerly were available only on one-year rental contracts with 176 hr/mo of free time.

Burroughs has not yet an-

nounced the details of its optional unbundling, which it has said will be offered to all customers.

One question raised by the dual pricing arrangement: How is a Burroughs branch manager going to react if he must choose between answering a call from a bundled user and one from an unbundled user who is paying separately for support?

90% Program Conversion Claimed by New Service

(Continued from Page 1)

include: the use of interchangeable NOP and B(ranch) instructions, the use of SBR instructions, complete handling of relative addressing (using the displacement address), work-mark switching, and overlay processing. Donato stated that each of these problems is completely handled by the system.

One local firm had engaged another company to convert some programs using the second company's programs package and had spent one year waiting for the conversion to work. The competing company was unable to make its converter handle the program properly. Total-Tran was able, the customer told CW, to convert the program and have it running in less than two hours after having received it.

One aid used in conversion is a console-oriented debugging package that intercepts all program interrupts and allows them to be bypassed. This permits the program to be completely executed on the first pass, saving debugging time.

The service is available through the company's offices here. The package probably will not be sold because of the proprietary nature of its functions, CPU said.

A typical 500-statement Auto-coder program can be translated

in a few minutes and operational in a few hours at a cost of \$300. A 1,000-statement program would require about the same time, but the cost would be only \$450. For a 2,000-statement program, the cost would be \$600.

Los Angeles Computerized Voting To Be Investigated by Commission

(Continued from Page 1)

chines to cheat even if tested for accuracy before and after the vote count. And *Computing Newsline* ran a contest earlier this year asking for methods of altering the vote count; the winner devised 120 different ways [CW, March 19].

Registrar-Recorder Lee declared that it was "virtually impossible" to rig the system but noted that "any system can be rigged if you have enough people in collusion."

IBM claims that a crooked technician could not get close enough to the computer or program to manipulate the count without attracting the attention of others. Furthermore, it argues that if a voting system were rigorously checked before and

after the vote count and then worked properly, it must have worked properly during the count.

But local experts disagree. They claim that it is possible to rig the computer so that it tells the truth at the start, then begins counting every 10th vote for a certain candidate, and finally becomes honest again and forgets that the manipulation was ever made.

Before adopting the Votomatic system, Los Angeles county used paper ballots; they have never used voting machines. In the 1968 presidential election, 2,700,000 people voted in the county.

IBM reports that it has 41 voting systems in 25 states.

EAI Hardware Can Now Be Rented

WEST LONG BRANCH, N.J. — Electronic Associates, Inc. has announced a rental plan for computer systems, digital plotters, and analytical instruments.

Systems can now be rented at 3% of system price per month

for a 12-month minimum term. At any time during the rental period, the equipment may be purchased with 60% of all monthly charges paid during the first two years credited toward purchase.

man of the planning committee for the 1970 ACM show, told CW.

He said, however, that it is hoped that the National Program Committee will recommend adoption of this plan in its special meeting to be held July 23.

"At present," he said, "we cannot commit ourselves to these plans without further approval. We had only received authorization to look into such plans at the executive committee meeting held in Boston during the SJCC." Matsa said that the responses received from the societies contacted indicated growing enthusiasm and support for the idea.



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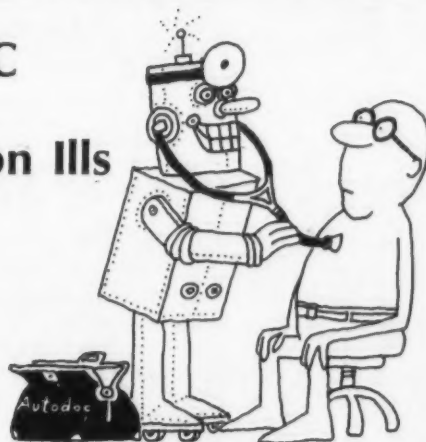
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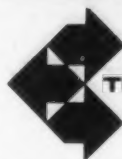
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Terminals Operate Up to 3,000 Feet From Controller

MINNEAPOLIS — A modular, multistation display features operation at distances up to 3,000 ft from the controller.

The subsystem, from Control Data Corp., consists of a 216-4 display controller that can handle up to 12 stations, 211-4 input units consisting of keyboard and CRT, and/or 218 output typewriters.

The stations have internal memories that allow operation off-line, except when communicating directly with a computer.

The subsystem, equipped with polling, is said to be especially suited to management information systems, military command and control, airline, and other moderately large-scale applications.

The 216-4 display controller sells for \$17,500, with a lease price of \$440 per month. The 211-4 input station has a purchase price of \$3,500, leasing for \$114 per month, while the 218 output station is listed at \$8,000 and leases for \$270 per month.

Data-Entry System

A data-entry system that features up to 12 input stations per controller has the ability to verify visually by CRT at each entry station and to record sizes of 160 to 1,920 characters.

The system is a refinement, at prices said to be somewhat lower, of Computer Consoles, Inc.'s previously announced 520 data-entry system.

The new unit can either record on magnetic tape or multiplex the information directly to a local or remote processor.

Prices and delivery information had not been made available at press time. The company can be contacted at 317 Main St., E. Rochester, N.Y. 14445.

General-Use Terminal

A terminal for time-sharing and general use incorporates the functions of a precision X-Y plotter with those of a normal teleprinter and costs less than half the price of equipment

giving equivalent performance, according to the manufacturer.

Called Typagraph Model 3, the unit is plug compatible with standard teletypewriters and operates not only in that fashion, but as a high-speed X-Y plotter. Text typing and graphics plotting are on the same continuous sheet of paper.

The monthly rental of \$200 includes maintenance and all required software for interfacing to a number of computers. It can also be purchased for \$6,000.

Further information is available from Typagraph Corp., San Diego, Calif.

On-Line Selectric

A small, modular attachment adapts the IBM Selectric typewriter to on-line use.

The product, the Holmes Tycom System, does not change the typewriter's normal operation or keyboard feel, according to Terminal Equipment Corp.

It extends the familiar office machine's capabilities and utilization to enable it to transmit and receive ASCII, EBCDIC, or Selectric at speeds of up to 175 words/min.

An optional paper-tape reader and punch may be added.

Through the modular approach, Tycom converts the typewriter into a complete work station with a complement of features not available in other terminal systems. It is also easily portable.

Tycom operates over any two-wire system, the manufacturer says. It accommodates all functions of the Selectric, including remote operation of tab set and tab clear and the five IBM Typamatic keys.

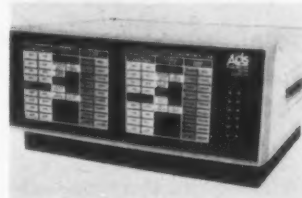
Tycom sends and receives up to 135 baud (depending upon code structure), provides parity on all transmitted and received signals, has a 16-character buffer, and permits all ASCII control characters.



General-Use Terminal



On-Line Selectric



High-Speed Modem



Noise Reducers

The Tycom modules (baseplate; logic console with ASCII, EBCDIC, or Selectric code cards; paper-tape reader and punch; optional carrying case; and optional work station) may be purchased individually, in any combination, or as a complete station, including Models 723, 725, or 735 IBM Selectric typewriters.

Terminal Equipment Corp. is located at 750 Hamburg Turnpike, Pompton Lakes, N.J. 07442.

High-Speed Modem

A 4800-bit/sec, automatically equalized, high-speed data modem provides optimum performance between a data source and its terminal equipment at greatly reduced operating costs, according to its developer.

Called the ADS-448, the modem eliminates the problem of manual equalization, enabling trouble-free data transmission and reception, according to the manufacturer, American Data Systems.

The receiver automatically equalizes within milliseconds after turn-on and tracks any changes in prevailing telephone line characteristics without adjustments.

The error rate is five times less than that of other existing modems (one in five million bits, depending on line conditions), the company says.

The new modem transmits and receives data at 4,800 bits/sec (or any combination of 1,200, 2,400, 3,600 equaling a total of 4,800 bits/sec), over Bell System Series 3002 telephone lines.

ADS-448 requires no special operator training or skill. Only

the connection of data lines, the selection of the transmit and receive data rates, and the activation of the power switch are required.

The company is located at 20747 Dearborn St., Chatsworth, Calif.

Noise Reducers

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Fall Joint Conference Technical Sessions May Offer Less Tedious Presentations

LOS ANGELES — The Technical Program Committee of the 1969 Fall Joint Computer Conference is continuing its attack on the "meeting tedium" problem of scientific conferences.

Technical Program Chairman Eugene M. Grabbe and R.E. Perry of Hughes Aircraft have developed an integrated program to provide incentives, training, and mechanisms for insuring better, more stimulating presentations.

The objective is to make the 1969 FJCC an audience-oriented and dynamic event, with papers meeting rigorous technical requirements.

Authors whose papers are ac-

cepted will be encouraged to attend two-day presentation seminars in Las Vegas during August for instruction in oral delivery and the use of visual aids.

The oral version of the presentation is expected to differ markedly from the written paper. The papers will be structured for use as reference sources, whereas the oral version is intended to be an instructive audio/visual presentation of selected highlights. All paper sessions will be videotaped and awards given for the best presentation as well as for best paper.

Authors are required to con-

form to standards for visual aids and to submit their visual aids for review before presentation. Speakers will be encouraged to abandon the lectern and stand next to the screen in a spotlighted position.

Better staging will be employed at the sessions. For example, dual screens will be provided for rooms in which the view of the screen is impaired by low ceilings. Videotape equipment will be placed so that it will not distract the speaker or the audience. Arrangements to dim, but not extinguish, room lights will be made. Rooms are being chosen that will best accommodate each particular session.

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Legal Protection Of Software Topic at Parley

BRIGHTON, England — A two-day conference entitled Legal Protection of Computer Programs will be held Nov. 13 and 14 at the Bedford Hotel here.

Organized by the Law Group of the British Computer Society, the conference will examine the issues involved in legal protection of software.

This is a subject of current concern to the computer industry because both the legal position and the effectiveness of methods of protection are uncertain.

Leading speakers from the United Kingdom, the United States, and Europe will outline current legal background and present views of the likely developments.

Further information can be obtained from the Conference Department, The British Computer Society, 21 Lamb's Conduit St., London, W.C.1, England.

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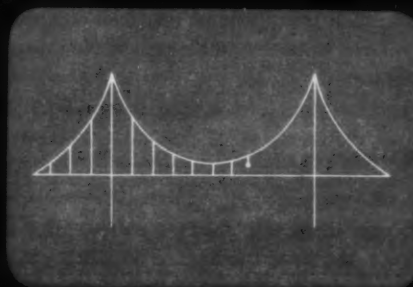
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Unbundling: What Does It Mean to the User?

Editorials

Too Soon to Judge

Many users have become upset over IBM's handling of unbundling, and at least one (see letters) holds CW responsible.

Admittedly, unbundling didn't come off the way we expected. We thought the drop in hardware costs would be substantially more than 3% — enough more to cover a large portion of the expense of buying software and services.

But we think it's a bit premature to start screaming that unbundling is a disaster to the user.

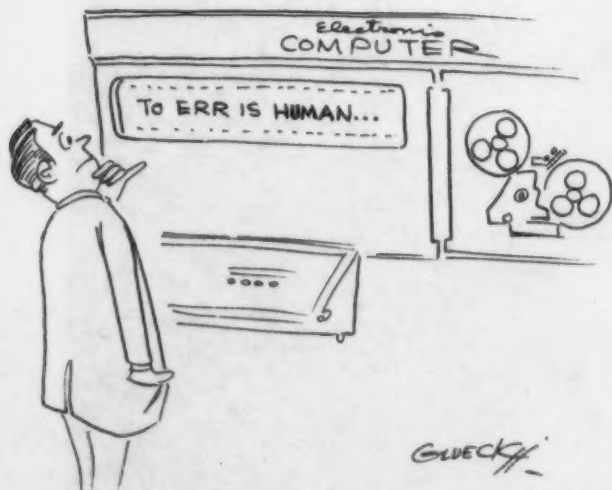
It's true that the initial effect is higher costs. But you can bet that these costs would have gone up one way or another even without unbundling. The whole country is suffering from inflation; it's not just the computer industry.

The important change is not the higher cost, it's that the user, for the first time, is forced to take responsibility for the reliable operation of his system. No longer can he hide behind the excuse that IBM is the largest manufacturer and therefore it must know what it's doing (and besides, the software's free). Now he will have to balance the cost of a package against its proven reliability. Maybe the cheapest — and the best — package will be offered by IBM. But if IBM's package is the cheapest and not the best, the user must balance the extra cost of an outside package against the loss of economy, efficiency, and reliability of the cheaper package.

Starting on this page, CW offers a roundup of opinion on unbundling. We have called on industry leaders, users, CW correspondents, and CW staff members for their opinions. None of them claims to know the final result. Change always is uncomfortable, because it forces us to think instead of acting solely on past experience.

We think it is too soon to pass final judgment.

Computerworld '69



Salesmen Being Retrained

IBM Gets Ready for New Role: Selling Software to Customers

By Peter L. Briggs
CW Staff Writer

Perhaps you have been wondering where all the new hardware that IBM is supposedly going to announce is? If so, you'll be disappointed. Current information indicates that no significant new hardware is going to come from IBM until January. The reasons for this seem to revolve around the problem of selling software — something IBM salesmen have never directly encountered before.

Six-Month Training Period

IBM stated that over the next six months, many software packages, including compilers, application programs, sorts, etc., would be announced and priced separately. Several industry sources have pointed out that this would allow just about enough time for IBM to properly train and condition its salesmen in the selling of software, rather than hardware.

As a customer, you can expect to be besieged, in a genteel manner of course, by polite IBM salesmen pushing the uses, advantages, and compatibility of the company's software. You can expect many different approaches to be used, allowing the salesmen to feel out the one that works best. You can expect to be educated, wheedled, aggressively convinced, logically reasoned with, and generally subjected to expert high-pressure sales techniques from what is considered to be the finest marketing and sales organization ever assembled.

IBM probably expects this to produce customers who are aware of all the good reasons why IBM software will be better for users of IBM machines.

These salesmen, remember, are the same ones who convinced you that the company's machines and packaged service were the best for your needs, so the

same arguments can be expected for convincing you that your present needs can best be satisfied by the same company's software.

In many cases, the salesmen are probably going to be right. IBM has spent millions of dollars developing software tailored to the type of customer using IBM machines. It has thousands of experts writing, designing, and documenting its software. It has developed the most complete, thorough, and sophisticated system for preparing documentation in the industry.

When someone buys software, he is buying two things: the documentation for that software and the reputation of the developer. IBM must stand high on the list for both counts.

Alternative Considerations

There are several alternatives to consider when purchasing software. IBM will definitely attempt to offer a complete answer, but it seems unlikely that it will be possible for IBM to provide complete coverage for all types and sizes of users.

There are pitfalls in obtaining software, be it from IBM or outside software firms. The main problems are in the areas of reputation and reliability. There are firms that will, for a stiff fee, perform comparative evaluation of two or more software packages against given specifications. This service, however, is probably viable only for larger installations, due to the high cost (generally into the thousands of dollars) of such testing.

At certain times, however, smaller installations would probably find this type of outside consulting advantageous, particularly when considering such packages as inventory control, bill-of-materials processing, financial management, etc. The consulting cost would probably be more than justified by the

avoidance of unanticipated problems.

Specialized Problems

For certain types of work, such as message switching, real-time processing for banking or industry, and specialized industrial applications, one can probably obtain a more suitable system from a company other than IBM. Particularly for the banking industry, the efficiency of such systems as on-line savings, commercial loan management, and time-deposit accounting is far more critical than it would be for ledger accounting or payroll processing. In these cases, the cost of outside analysis, the cost of comparative studies, and the manpower needed to prepare testing data are far less expensive than the possible costs of omitting these steps.

When it comes to system alterations, service and maintenance, and emergency repairs, it might also be better, in such cases, to have a company consider you a major user, rather than simply one of several thousand. Smaller companies, therefore, would probably offer these specialized customers more for their money than IBM could possibly manage.

Many Considerations

When considering the investment, the amount of time needed to prepare for conversion, the cost of analysis, and the necessity for proper evaluation of particular needs, one must carefully plan to cope with the new sales techniques expected from IBM. Both the strong points of IBM software and the advantages of working with smaller companies must be considered. One can't afford to ignore these considerations unless he is prepared to spend far more time and money for converting and redesigning than was anticipated or is desirable.

Letters to the Editor

Unbundling Brings Anguished Cry From One 'Who Lost the War'

I am sure *Computerworld* helped win the Battle of Unbundling and takes credit for supporting those who brought enough pressure to cause IBM to change their policy to separate charges for software, systems support, and education.

You have championed the cause of free enterprise and no doubt built a better market for more advertising by the many software, consulting, and education organizations which are sure to flourish.

Yes, you have won the battle, but for all of us medium and small computer users who "lost the war," NO THANKS.

It is going to cost all of us "less than giants" a lot of money and a heck of a lot of precious time.

It seems to me your greatest number of potential readers are not the purchasing agents of the U.S. Government nor the industrial giants. How about checking the census of general-purpose machines

as to which categories the majorities are found.

We had enough problems already without the extra burdens you have now helped saddle us with in the interest of Big Government, Free Enterprise, and more advertisers.

John R. Lyle

Director, Management Information Systems
Washington Manufacturing Co.
Nashville, Tenn.

See editorial, Ed.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, *Computerworld*, 60 Austin St., Newton, Mass. 02160.

Unbundling: What Does It Mean to the User?

Cost of Systems Engineers Now a Key Problem

By Hedley Voysey

Special to Computerworld

The user's problems in interpreting IBM's unbundling moves is linked to the many and varied duties carried out by systems engineers in the past. The new software maintenance role, which remains bundled with the rental fee, may supply many of these services.

One user in the large utility field in the Washington area has a systems engineer whose job is just to keep the software updates on-stream and correctly incorporated in the user's loaded system. Now either he will have to be hired from IBM, which will raise installation costs by quite a margin, or the same role can be carried out by a new staff member of the user's team.

The salary structure available to the user makes the immediate hiring of a suitably qualified man a most unlikely proposition. The necessary change to the structure will most certainly not be effected quickly. The best way of enabling this kind of user to raise his salary sights is the formation of a new company which will contract to carry out the duties of the current systems engineer.

Any move of this nature will take months to be in action and cannot be started until it is quite clear that the software terms of IBM's field engineering division exclude such an interpretation of their role. Provisionally, therefore, the user will have to allow a 20% increase in his budget to cover the contingencies of the situation.

IBM Software Marketing Policies Still Mystery

The structure of the IBM selling drive behind its software products is still very much a user guessing game.

Reputed commission rates on the order of 10% indicate that IBM intends to sell and to offer its staff an alternative to the "slice-of-the-action" approach of the independent software firms.

But for a user interested in both Cobol and Fortran, for instance, will the price on PL/I be set to make this look like the logical way forward? Or will IBM use the reverse of this strategy to divest itself of this maintenance and standardization chore?

For other styles of program products, the betting is that the alternative options will be priced in favor of the user who accumulates hardware like beads in a monastery. Devotion to the storage options favored by IBM mass production may well reap a program product indulgence.

Another query concerns the applications programs built upon a common language foundation, such as Cobol. The user who is concerned solely with such an upper-layer package may look askance at being asked to pay the full price for the common language subprocessor.

Unbundling's Effects On DP Education

The price put by IBM on its

educational services may yet succeed in staving off extinction for the private data processing schools.

The fear of the new instability in computer education is to some extent counterbalanced by the belief that a good many IBM professionals in the field may be encouraged to set up shop on their own account, or will be wooed by UCC's educational drive, and so establish comparatively much higher standards than have been the commercial norm in the past.

The real drive to put the bad guys out of business was due to begin towards the end of July

when Bema headquarters will shift to Washington. The stage would then be set for the accrediting commissions recognized by the U.S. Office of Education to be linked with the joint professional group established under the umbrella of the ACM and for all parties to gain access to the ear of Bema.

The noncollegiate list of schools numbers at least 600 and very probably runs to 1,000, with a mere 60 of that number accredited at present.

The pressure on budgets caused by IBM pricing policies may possibly drive some weary DP managers to restrict their re-

quests for increases by collaborating with local private schools, thus temporarily giving them respectable user references. The inadequacy of this arrangement may take some time to become apparent, during which the recent hopes of upgrading may fade badly, dispiriting and maybe disuniting the monitoring groups.

Benchmark System May Be Discredited

The Washington attitude of complacent contemplation of the IBM price structure changes has evaporated as the full implications have come bubbling to

the surface.

The benchmark mechanics, so laboriously established over the last two years, are threatened with a complete breakdown as the unbundling opens up the hardware/software options. If eight hardware proposals are submitted, each with three options on a single element of program product, the benchmark must be carried out with all alternatives, or else the hardware firm or the software suppliers will be writing letters to congressmen.

In the case of a common language compiler, where the tender

(Continued on Page 10)

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Unbundling: What Does It Mean to the User?

Some End-Users May Be About to Enter Most Disruptive Period, Randolph Says

By John M. Randolph
Chairman of the Board
Randolph Computer Corp.

The IBM announcement will rapidly create profound changes in the data processing industry. Some users are about to enter a most disruptive period; others will operate with no discernible difficulty.

One of the most ingenious aspects of the announcement is that it is hard to see its impact clearly.

• We believe that across-the-board users are faced with at least a 10-15% increase in data

processing costs. In an inflationary economy, IBM is certainly entitled to offset rising costs, particularly the high cost of its professional staffs.

• Small- and medium-size users of data processing with modest in-house capabilities will have less opportunity to hold down the cost increase than will large users with substantial in-house staffs.

• Obviously, unbundling provides further opportunities for others to supply services previously provided by IBM.

However, based on price schedules published to date, I would say that the independent entrepreneur is not going to have an easy time.

Professionals should be charged out at three to four times their salaries. The IBM pricing seems to be considerably below this.

• Unbundling recognizes that the nonhardware aspects of data processing will constitute a growing proportion of costs. IBM clearly wants to capitalize on its skills in this area.

• Now that all users of IBM



John M. Randolph

equipment may secure identical services regardless of ownership, substantial uncertainty has been removed from the computer-leasing industry.

No Impact On Users Foreseen

By Norman E. Friedmann
President, Chief Executive
Computing and Software, Inc.

I do not think that the IBM unbundling action will have a significant effect on the user of their hardware and software.

This action is comparable to sale of a basic item and then sale of accessories, as is common in the automotive industry.

Therefore, I would expect that the flexibility to the user would be comparable.

This action will not have a significant effect on the suppliers of software within the software industry.

I do not envision either that it will significantly influence the position in the market of other original-equipment manufacturers.



Norman E. Friedmann

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Benchmark Idea May Be Harmed

(Continued from Page 9)

calls for a standard implementation, the benchmark effort must run the gamut of all possible permutations. The day of the infinitely extended benchmark test is not far off in this context, and there is a dark suspicion in some offices in the Pentagon that IBM is well aware that discrediting the benchmark idea may be good for the IBM profit picture.

The current preoccupation of supply agency controllers is with the apportionment of benchmark costs when software firms provide options attractive to the potential user, but not encouraged by the manufacturer who declines to pay for the computer time involved. Software houses will perhaps be prepared to pay, but only at rates equivalent to the rates charged by the manufacturer to the "internal" software group.

Unfair competition cries are already being tape recorded around the Washington software scene with gaps left in them to simplify the dubbing of appropriate dollar figures.

Unbundling: What Does It Mean to the User?

Marketplace Will Mature Much Faster Than IBM Can Fill the Need, Bauer Says

by Walter F. Bauer
President
Informatics

A major point which does not seem to be fully appreciated is that IBM, either by design or happenstance, has dominated the industry in ways other than the percentage of computer or dollar business volume.

Through the last 17 years of the commercially available computer, whatever IBM has said or done has been the *de facto* way of doing business in data processing. This has led to an unnatural and abnormal development of all segments of the industry including hardware, software, and user patterns. Many good technical developments were not accepted by the user community simply because they "were not IBM's approach."

When IBM espoused the philosophy of free software and the paternalistic, we'll-do-everything-for-you philosophy, it delayed for many years the development of software and service sectors of data processing.

The independent software industry has penetrated the market to only a few percent; the great challenge of a software company is not its competitor, but rather the purchasing patterns of the industry which are only now showing the first signs of service and software bought separately from hardware in an appreciable amount.

The importance of the IBM separate pricing move is that these changing patterns of the industry will be very greatly accelerated; it will now be considered *de rigueur* to buy software and services separately.

Certainly IBM has acted as a responsible company in its dominating position. But those who say "IBM has been good for the industry" are looking only at the industry after the development of certain patterns.

Consider what the industry would be like today if in the mid-Fifties four or five companies had begun sharing, in some equal sense, the entire hardware business! Or, consider what would have happened if software would have been priced separately starting in 1956!

The importance to the user in the IBM move is that he will become more aware, more discerning, and more discriminating about software costs and quality. He will become more sophisticated in his business approach to solving problems—he will look to different ways of purchasing expert capabilities which his staff does not possess, or software which can be used to his advantage.

In other words, data processing management will be encouraged to take a more business-like approach.

The importance of IBM's action to the software industry is that, finally, the marketplace will mature at a faster rate. The maturing will take place much faster than IBM will be able to grow software product- and service-wise to fill the need.

We have already seen a few non-IBM software products make significant sales successes. I foresee a greatly accelerated growth of software supplied sep-

arately, especially software products which will become a multi-billion dollar business in five to seven years.

I am convinced that the separate pricing move will be greatly beneficial to software companies.

Those who are concerned about the smallness (3%) of the price decrease may be taking a myopic view. The importance of all of this is that an important principal has been established—one which will have far-reaching beneficial effects on the industry.

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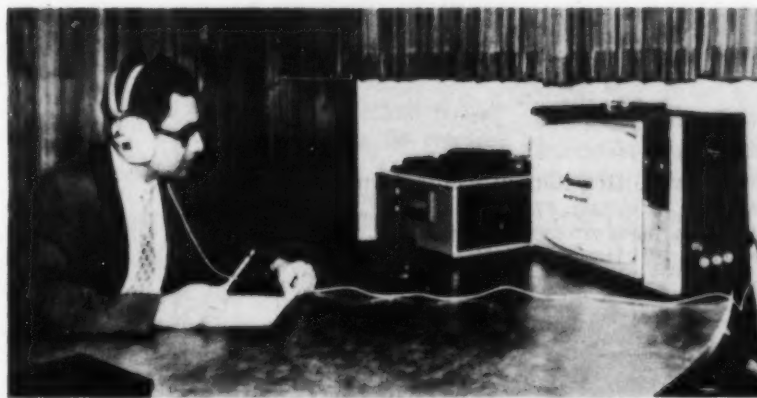


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Unbundling: What Does It Mean to the User?

Users Will Have a Freer Choice of Support

By John T. Potter
President
Potter Instrument Co.

IBM's recent announcement of a new way of doing business gives rise to the need to consider the impact the changes will have in our industry and, in particular, the effects on us, the independent peripheral equipment manufacturers.

While it is too early to foresee all the effects IBM's actions will have in the industry, it appears that in the long term, the users of data processing equipment will be paying more for their computer operations.

The services which IBM is now offering for a fee are those

which require human skills and are therefore subject to the pressures of increasing costs for salaries, fringe benefits, etc.

On the other hand, each user will now have a freer choice in deciding how much and from whom to obtain his required support services — systems-engineering services, educational services, program products — and the user will be able to evaluate his costs for these services on a competitive basis.

IBM's entry into open competition in the support-services areas should, in the long run, bring about a more independent appraisal by the users of their

computer operations and, therefore, prove to be beneficial to the industry.

We, as an independent peripheral equipment manufacturer, have had our best successes to date with customers who have been conducting independent appraisals of their computer operations and evaluating the performance-to-price relationship.

We feel that as more and more customers enter into such appraisals and evaluations the size of the markets open to competi-

tion by the independent peripheral equipment manufacturers should increase.

IBM's recent announcement should enable a more direct competition for peripheral equipment on a product-by-product basis, with the customer free to choose the source of his support services.

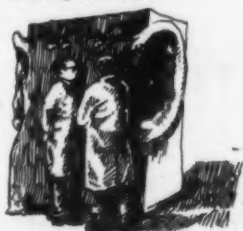
If this proves to be the impact of IBM's new way of doing business, then all of us — the customers, the independent peripheral equipment manufacturers, IBM, and the industry —



John T. Potter

should benefit. Let's wait and see.

If you can talk to your computer in language you understand and have it generate routine reports more economically and easily, then you can think bigger too — thanks to RPG.



codon's Report Program Generator (RPG) is similar to the RPG's used on general purpose business computers but written to be effective in the small computer environment. RPG language is based on a series of Specification Forms that define the operating parameters for a given processing function. That's why using RPG is literally as simple as filling in the blanks.

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- You can, in many cases, automate your inventory, payroll or other reports for less than the cost of a file clerk



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- RPG-8 for your PDP-8 computers (with only 4K core)
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- RPG-10 for your PDP-10 computers
- RPG-15 for your PDP-15 computers

Also available for PDP-10 users who desire a more general purpose business-oriented language: COBOL-10. Version I is available on an off-the-shelf basis now. And... codon can offer you an economical custom RPG program for your computer. For price and delivery information on Report Program Generators, please call (617) 891-1700

RPG makes small computers think big when it comes to generating reports



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Threat of Greater IBM Domination Seen

By G.W. Woerner Jr.

President
Computer Technology Inc.

Although the customer will be reading IBM's announcement with an eye to its impact on his DP budget, he is also interested in whether it improves the free and competitive environment in the industry. Although this environment will be somewhat improved by the unbundling of prices which took place, in our considered view, IBM was shock-

ingly remiss in not similarly unbundling its organizational approach to bringing these services to the market.

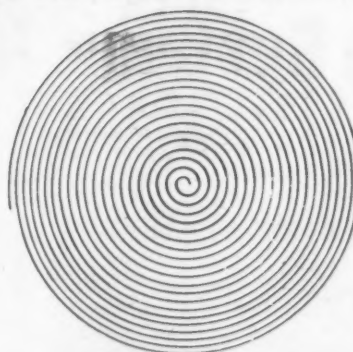
For instance, the fact that these services will remain under the organizational control of the data processing division means that in a very real sense, IBM can perpetuate its almost total domination of the decision-making processing of its users — to the detriment of its competition.

An even more disturbing aspect of the possible continuance of IBM's account domination is the data processing division's addition of a custom contract service capability.

By assuming responsibility for design and installation of a customer's data processing system — and having it come under the same operations as its other sales and service activities — IBM could dominate the marketplace to an even greater degree.

Until we can learn more about IBM's intentions, therefore, we are not at all certain that the "unbundling" will answer the many recent objections to IBM's way of doing business or its dominance of the marketplace.

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Firm to Analyze IBM Unbundling

NEW YORK — Programming Sciences Corp. has undertaken an in-depth, written analysis of the implications of IBM's recent "unbundling" announcement for EDP users.

The software development and systems programming firm also said it is offering a custom survey service to EDP users by PSC senior analysts who will prepare a detailed report on the effects of IBM's announcement on the user's own EDP installation.

The written report in booklet form for general distribution is aimed at corporate management and will analyze in detail the impact of IBM's decision on the EDP industry as a whole and the possible impact of future announcements by IBM on its pricing policies.

Available by the end of July and priced under \$50, the report will also explore the effects of the announcement in such areas as equipment and personnel costs and the training of personnel, according to the firm, located at 90 Park Ave., New York, N.Y.



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File Exec gives you great flexibility in file creation, file maintenance, and information retrieval on either tape or disk files.

Written entirely in COBOL, this new system creates files from source data, existing disjoint files or a combination of existing files and source data. After files are created, complete records can be added, data can be added to existing records, fields can be changed and

entire records can be deleted.

There's flexibility, too, in FILE EXEC's information retrieval capabilities. This system allows you to select complete records or parts of records based on up to 450 sets of "and/or" conditions. Conditions of selection can be greater than, less than, equal to, or not equal.

FILE EXEC is format independent and allows for re-formatting of complete output records on selected data to tape or disk and/or printer. All of these capabilities are part of the basic system.

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Unbundling: What Does It Mean to the User?



Robert L. Harmon

'Unleashing Healthy, Competitive Struggle'

ST. LOUIS, Mo. — The recent unbundling action by IBM will ignite a series of "secondary explosions" in the industry that will cause both opportunity and distress, according to Robert L. Harmon, vice-president and general manager of McDonnell Automation Co.

"IBM's unbundling will unleash a healthy competitive struggle among computer software suppliers," Harmon said, "and a series of secondary explosions will affect the computer industry and individual computer users."

He described these secondary explosions as overall higher op-

erating costs to most computer users, an increased demand for experienced programmers and other data processing personnel, and a healthier marketplace for companies that specialize in developing computer software.

"The computer user will no longer be able to take the wait-and-see attitude toward obtaining software for his computers," Harmon said. "In the past, clients would simply delay developing software at their own expense because IBM might offer a similar package without charge in the future."

For instance, McDonnell Automation Co. developed an ad-

vanced, comprehensive, project-management system he said, but some clients were hesitant to purchase it when they could get something similar without cost from IBM.

Proprietary Benefits

"Many of the so-called 'free' packages do not have the features or benefits that a proprietary package offers," Harmon said. "Consequently, the computer users are operating their equipment at less than maximum efficiency. Often times, the free packages are false economy in the long run."

Other secondary reactions will

include staffing and training, Harmon said. "Those companies which operate computers, but are not in the computer-service business, will find it difficult and expensive to compete successfully in attracting the bright young people necessary to develop their programs. The industry will probably go through another round of frantic searching for competent people."

It is precisely this situation, he said, that will make software development a more competitive business.

Big Advantage Is Competition, Caveney Says

By L. Richard Caveney
Director, Government Marketing
Bryant Computer Products

Competition is the major advantage which will be the ultimate outcome regarding the end-user in respect to the IBM action.

That is, the end-user would have, in my opinion, forced a broader competitive line with IBM, but the current situation with IBM has accelerated the competitive mood of the end-user as he is acquiring the in-depth technology and financial understanding required to procure or lease a total computer system.



L. Richard Caveney

First, without the current legal actions by the government and nongovernmental segments against IBM, the end-user would have created a very difficult competitive position for IBM; however, the time frame would have been much longer.

I base this fact on the in-depth technical and financial understanding of purchasing total computer systems from one computer manufacturer versus buying individual devices/peripheral and marrying the total system by the end-user.

Secondly, end-users with such technical and financial knowledge who own total systems would expand such systems by adding peripheral devices, yet obtaining the end result for which the end-user desired versus purchasing a totally new computer system.

In both cases the basic under-
(Continued on Page 15)

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Wall Street Data Processing Personnel Get Crash Course in Brokerage Business

NEW YORK — Data processing personnel who have recently joined Wall Street investment

firms were initiated into procedures of the brokerage business in a two-week course held at

Strategic Systems Institute.

Daily three-hour sessions covered topics such as the front office and its functions; the borrowing and loaning of stocks; stock records and dividends; and the margin and bookkeeping departments.

Students were briefed on the operations of the various stock exchanges and instructed on the relationship of data processing to the conduct of a brokerage firm.

The course was part of Wall Street's effort to automate and speed its operations to ease the logjam of paper work caused by the investing public's burgeoning interest in the market.

Unbundling: What's It Mean?

Recognition of a Growing Maturity of DP Industry

Harvey N. Berlent, president of The Computer Exchange, Inc., lauded IBM's new pricing position "as a recognition of the growing maturity of the data processing industry."

"It allows the user to select and pay for only those services which he needs," he said.

Berlent said that many of the reservations computer users have about buying previously owned IBM computers have been eliminated, as all computer users are now supported by IBM without discrimination, at the same price for the same services.

He added, "The announcement broadens the opportunity for companies requiring data processing services to select the source and services in terms of their own needs. At the same time this move places an additional responsibility on the user to clearly define his actual requirements."

"This judgment must now be based on facts, logic, costs, and the evaluation of alternative courses of action."

Berlent stated that he felt the announcement would give added impetus to the rapidly growing computer after-market.

"Since support services will be available to all users at the same price, any economies obtained through the purchase of previously owned hardware will stand untouched and unmodified," he said.

Market Helped By Competition

(Continued from Page 14)

lying factor is pure economics — as economics of the end-user would sooner or later make the end-user seek in-depth knowledge of computer systems including hardware, software, systems integration, etc.

The end-user would look at all products available as he became more technically oriented; thus, a more competitive computer/peripheral market would emerge against IBM.

IBM would have been forced by such competition to re-evaluate its total position including, if any, activities which would place them in the now legal situation.

The end-user is being forced mentally by the current action against IBM to investigate on their own such charges with the end result being the end-user will achieve the technical competency in a very short time frame.

Thus, the emergence of greater competition for the end-user's purchasing power is the end result of the attacks against IBM.



the computer industry's first key-to-disc data input system accepts the output from 60 or more key stations simultaneously

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By time-sharing the data from 60 or more keyboard operators simultaneously, significant savings in data station costs of as much as 50% can be achieved. Costs drop to as low as \$4300 per data station for a typical 60 station system. For large data preparation installations, the time-shared input is the only economical way to go.

Data entered into the LC-720 is processed by a small digital computer and stored on an IBM/

360-compatible magnetic disc that provides the advantages of bulk storage and high speed random access of data. The problems associated with punched card handling or the mounting, pooling, merging and unmounting of magnetic tape reels are eliminated. All data is conveniently and economically stored in an IBM 1316 disc pack for direct high speed input to your modern data processing system. Naturally, an IBM/360-compatible magnetic tape is also provided with the system as standard equipment.

The LC-720 KeyDisc System also offers for the first time, data verification requiring one input pass only through the system, in addition to the normal technique of verification requiring two different operators. Record size is infinitely variable by each operator from 1 to 120 characters long and the system stores a large library of 30 or more different format control programs, all available simultaneously to any and all operators.

LC-720 KeyDisc System

Bring your own data for a demonstration

Logic Corporation invites you to see an operating demonstration of the LC-720 KeyDisc System at the company's premises. Bring your own original data and Logic will provide a reel of magnetic tape of the output of your data from the LC-720 for later printout at your own computer facility.

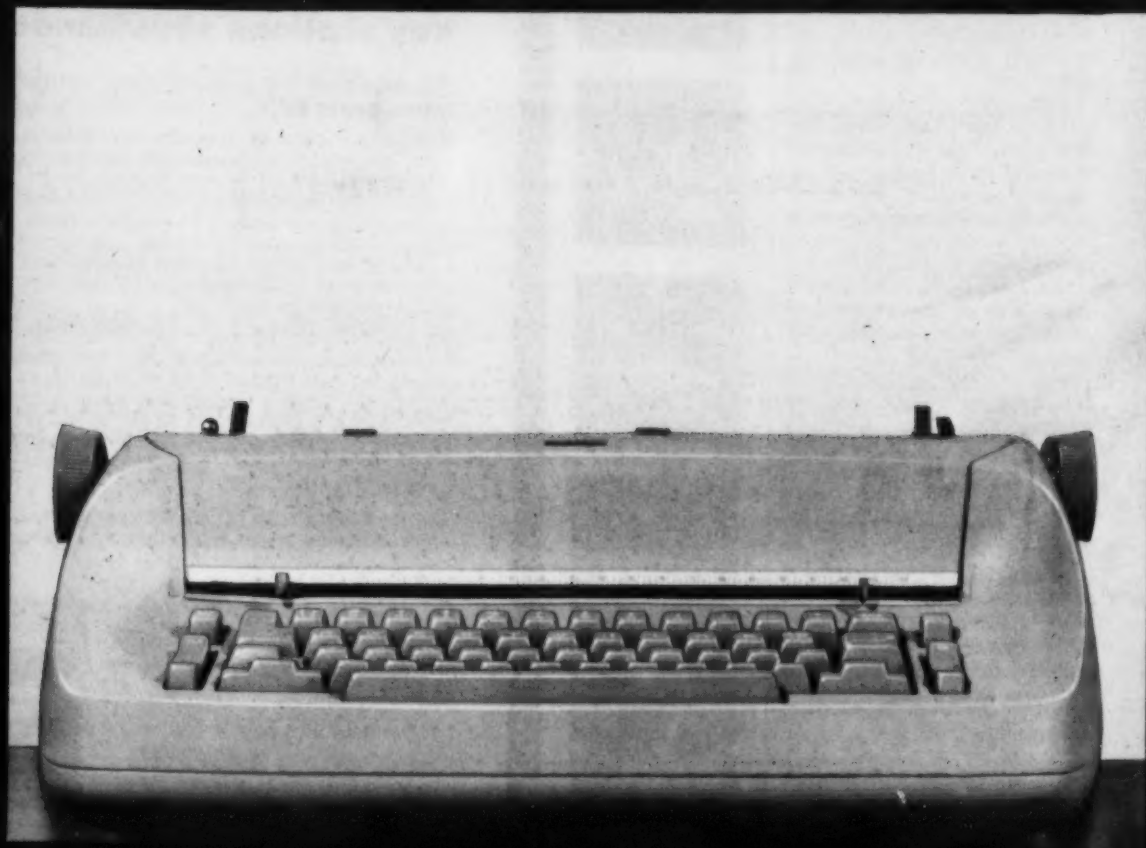
To arrange for a demonstration, contact Gary Tischler, Director of Marketing (201) 334-3713

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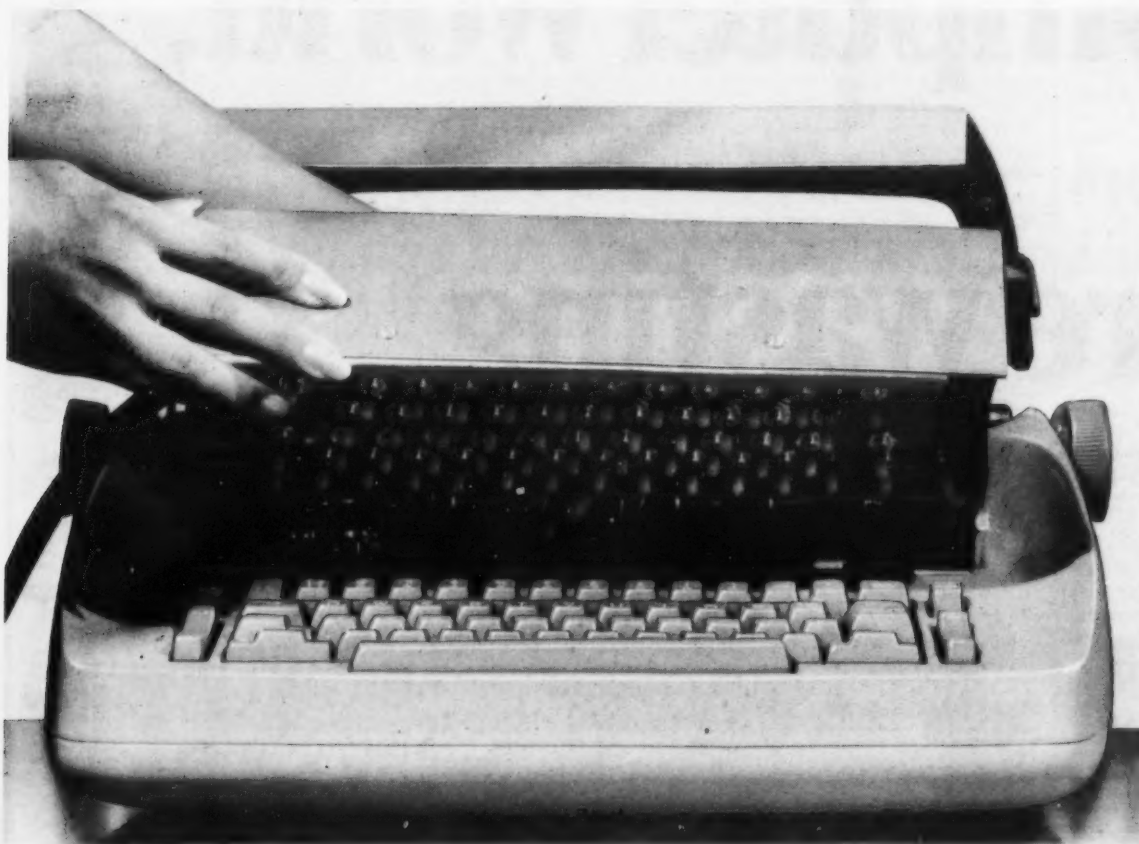
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In short, System 21 provides low-cost, desktop tools to make computer work out of all your paper work. Working from a standard keyboard any clerk can record and visually verify data by filling in the blanks on a System 21 video display. Key punch/verifier and key/tape operations are bypassed.

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But how old is your copy when you get it? A week? Two weeks? If it's more than two days, you've defeated our entire purpose in life: to bring you all the news of the computer field as it happens. Not a month later. In fact, we're the only publication that does this — the only weekly for the EDP field. But you know a lot about us already. After all, you're reading Computerworld right now.

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July 23, 1969

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S/360 Programs Can Now Access 1401-Compatible Files

HINGHAM, Mass. — By the use of a new \$5,900 software package, S/360 computer installations using disk storage files under 1440 or 1401 compatibility can stop writing S/360 programs and start writing S/360 programs. These will not have to be altered when the files are converted to native S/360 systems, according to Austin Systems Co., the developer.

The installations can rewrite present 1400 programs in native S/360 languages one at a time,

while still operating the remaining 1400 programs. Austin claims the package permits an orderly and efficient conversion, and that this approach can save the typical installation at least \$20,000 in programming and computer time.

S/360 Can Read 1401 Files

The LIOCS simulation system simulates the operations of the S/360 logical input/output control system, but uses disk files created by second-generation

programs. That is, the system allows S/360-made programs to read 1400 data and to produce data acceptable to the existing 1400 programs.

This is achieved through the incorporation of an interface between the user's program and the disk file. The interface also provides additional flexibility by elimination of complicated cutover procedures during conversion. By replacing the interface with one that uses the native S/360 LIOCS, the final conversion of

the programs to native S/360 file organization systems is quickly and simply accomplished, the company said.

When all of the programs that use a particular file have been rewritten, the file and its associated programs can be converted within a few hours. Since the programs were tested and installed one at a time over an extended period, the necessity of expensive parallel operations or the potential of extensive downtime in attempting a conversion are virtually eliminated, the company said.

The system also enables the user immediately to start using the higher-level programming languages available to the S/360 and designed to reduce programming costs. These programs therefore can operate at the maximum speed of the computer. In addition, the system uses about 4K less core storage than the compatibility operating systems. Thus, a large amount of core storage is available for solving problems rather than emulating computers.

The system consists of three basic components: (1) a set of modules that simulates the S/360 sequential, index sequential, and direct address processing using 1400 compatibility files; (2) a set of 24 imperative macros that performs input/output operations equivalent to their S/360

counterparts; and (3) a set of declarative macros used to define the specifications of the file being used. The system resembles the S/360 LIOCS system in both use and application.

Almost All Features Available

Almost all of the features available to the native S/360 programs using LIOCS are available to the installation using the Austin LIOCS simulation system. This is a comprehensive system — index sequential key search operations, direct-access, search-multiple operations, and all of the facilities of the sequential work files are standard. Installations that contemplate converting their 1400 consecutive files to index sequential files can use the system to process their consecutive files as if they were, in fact, index sequential files. The system uses DOS disk-label checking. The programs do not use any special control cards. In essence, they are S/360 programs. A special utility program is provided to assist the user in preparing S/360 labels to match his 1400 labels.

The system is priced at \$5,875. Included are the software package, a sample program designed to teach the beginner to use the system, instruction manuals, and 20 man-hours of customer training and installation assistance provided by a local franchised technical representative.

Independent Software Tests Are Now Available From 'Pat'

BALTIMORE — Independent testing of software packages is now available to software purchasers.

Computer Center, Inc. is now offering a service called program

analysis and testing (Pat) that tests systems and applications programs according to specifications supplied by the user and determines the areas where failures occur. Testing cost is es-

timated at 10% to 20% of the development cost.

Documentation Certification

The service also certifies that the documentation meets the specifications of, and agrees with, the program being tested.

"To the best of my knowledge," said Jerome Markman, company president, "this is the first time that potential purchasers of software have had the opportunity to have an independent test of the program performed."

Pat can also be utilized by internal program-development operations to test the success of programs they have developed. This will, the company claims, allow companies to avoid many of the problems inherent in application development, especially those that relate to making a program function perfectly before it is released.

Markman said that packages that have had independent tests receive much more attention from potential customers than those for which there is no way to guarantee performance.

New Accounting Packages Available From Data Link

DALLAS — A new accounting package that supports general ledger, accounts receivable, and accounts payable is now being marketed through the Data Link Division, University Computing.

Called CPA-3 (comprehensive program for accounting in three parts), the package is aimed at both certified public accounting firms and corporations desiring to perform internal accounting, according to Data Link.

The general ledger subsystem performs multilevel report generation in addition to providing all the normal functions required of a ledger balance system, ac-

cording to O.F. Shinn, company marketing vice-president. The accounts-receivable subsystem provides billing based on minimizing cash requirements, as well as analysis, verification, and maintenance of A/R records. The accounts-payable subsystem processes all reports on a company's liabilities, thus providing an orderly payment cycle. It also aids in budget forecasting and analysis and in report preparation for management.

The package is available through Data Link service centers on a lease basis or may be purchased for \$12,500.

Sim-8 Simulates PDP-8 and PDP-5

PRINCETON, N. J. — Users of AI/Com time-sharing can now use Sim-8, a simulator for the PDP-8 and PDP-5 computers, according to a recent announcement from Applied Logic Corp. here.

The simulator runs on AI/Com's dual PDP-10 system, providing the speed advantages available through this larger system. The company points out that debugging can consume over one-third of the time available on a smaller system, such as a PDP-8, severely limiting the amount of processing done. Through the use of the DDT (dynamic debugging technique) package, Sim-8 can cut the debugging time in half, the company says.

Sim-8 requires 8K of memory and simulates the reader and punch through the disk-storage capability of the PDP-10. Disk and drum simulation will soon be available, according to the company.

Computerworld is preparing two special articles, one on "The Problems of S/360 Conversion" and the other on "File Security and Data Protection."

Anyone working with, developing, or currently leasing or using such packages or a service performing these functions is invited to send descriptive information to: Peter L. Briggs, Software Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Dynamic Memory Allocation Added To Sigma-5 and Sigma-7 Via RBM

EL SEGUNDO, Calif. — A new version of the SDS Real-Time Batch Monitor (RBM) is available for use with the Sigma 5 and 7 series of computers.

Including the standard RBM features permitting foreground/background processing and batch programming in the background, the new version can handle multiple foreground users, automatic checkpoint for the background, and call re-entrant subroutines from the library.

Dynamic memory reallocation, direct I/O operation, loading of foreground tasks from the background, and rapid interrupt

response are all new features. With the new system, features and resources not required for the foreground are allocated to the background on a demand-schedule basis.

New batch features include complete disk-file processing, several new language processors, and overlay capabilities. Languages include Fortran IV-H, Macro-Symbol, and Simulation Language-I. The Rapid Access Data package for the disks is now available, as is an overlay loader.

RBM requires 4K words in a 16K-word machine, one SDS RAD file, and paper tape or card,

Better Corporate Model Aim of New T/S System

NEW YORK — A time-shared, mathematical programming system aimed at improving corporate modeling has been announced by Davis Computer Systems, Inc. According to Dr. Robert S. Davis, company president, the package will be available for all AI/Com users and is written for the PDP-10.

The aim of the program, according to Davis, is to facilitate experts' use of mathematical modeling through a conversational terminal. He claims that the system can handle almost any degree of complexity in the model, as well as in the data. Known as MPS-10, the package provides analyses of alternate possibilities in corporate growth and planning, allowing management to obtain more responsive information on a more timely basis, Davis said.

The system consists of two parts: the optimizer and the procedures. The optimizer is an adaptation of the Rand Corpora-

tion's University of Southern California M3 code, developed recently for mathematical modeling. The program contains tools for both linear and single-state problem definitions. Both upper-bounded and dual-bounded algorithms are supplied, permitting the solution of nonlinear functions.

Several procedural routines are available with the package to provide both preprocessing and postprocessing of problem data. The procedures are modular in design, permitting intermixing in any combination. Most of the bookkeeping chores of data reduction, analysis of variance, and statistical error prediction are available through these procedures.

The program is available either for purchase or through the AI/Com time-sharing service. Detailed information on time-shared rates can be obtained through the company here at 280 Park Ave.

Scientific Software Firm Formed

PALO ALTO, Calif. — A new division of Ness Consultants has been formed to offer scientific programming services, according to Ricardo J. Alfaro, division manager.

The company, located here at 597 Lytton Ave., is a division of

Ness Industries and is made up of several men from the Sunnyvale G. E. group (mainly engaged in Air Force contract work).

The company plans to offer specialized services in several areas, based on the past experience and specialized knowledge of its staff.

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For Wats Users

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HARTSDALE, N.Y. — Telnete (telephone network evaluator) can provide large cost savings for users of large-scale telephone communications systems, according to the developer, Worldwide Computer Services, Inc.

Written in Fortran IV and currently running on S/360 with a minimum of 128K, the package can analyze any network of incoming Wats (wide-area telephone service) lines for call density, coverage, and costs. The system requires that the user specify the locations of local lines and the total calls expected per month. The system then breaks this down into geographical and statistical groups for cost estimation.

Selling for \$9,000, or available

as a service for \$500 per run plus the cost of computer time, Telnete can: calculate the number of calls generated by each urban and rural area; check the network for completeness and print out noncovered areas; allocate rural and urban areas to the appropriate office; and calculate the overall cost of the network, detailing line costs, connection costs, and office costs.

The company claims that the program can analyze an office system with 10 locations in about three minutes of computer time.

Prices include a sample run, complete documentation, and a guarantee of performance through maintenance.

Computerworld '69

60



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codex
corporation

July 23, 1969

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Goodbody's Autocage system is demonstrated to Harold P. Goodbody, senior partner, by Mario J. Nigro (left), partner and assistant director of operations, and Karen Fleischer.

Leasco Stops Leasing Computers In U.S., Will Continue Abroad

By a CW Staff Writer

NEW YORK — Leasco Data Processing Equipment Corp. is stepping out of the U.S. computer leasing business until U.S. money rates cool down.

The company announced that it has stopped further acquisition of computers for lease to U.S. customers, but will continue marketing leases throughout Europe.

A company spokesman boiled down the logic behind Leasco's move into three major aspects: cheaper borrowing costs; better return on money; and longer

leases.

He also indicated that this was by no means Leasco's last step toward expanding its European market.

"Within seven to eight months, I see Leasco starting a heavy penetration into the European time-sharing market with an initial expenditure of over \$7 million," the spokesman commented.

Leasco is depending on a high percentage of European credit to finance its leasing operations through Leasco-Europa Ltd. in London and apparently is having

no trouble finding available Euro-dollars.

The Leasco spokesman said that companies abroad were much more receptive to leasing third-generation computers and, because of their relative scarcity, were happy to pay premium rates.

Average leasing terms of five and a half years instead of the four or fewer years common in the U.S. was also a major factor.

Saul Steinberg, chairman, said the decision was not likely to affect Leasco's income significantly because of the large total of lease receivables presently on the books.

Steinberg added that the decision will free sales and technical personnel to work on Leasco's nationwide time-sharing service.

He also reported that in the first six months of fiscal 1969 domestic leasing accounted for about 8% of Leasco's profits.

More Pergamon Press

Leasco reported during the interview that as of July 9, it had purchased 24.8% of Pergamon Press Ltd. through open market operations.

This, coupled with the 34% owned by Robert Maxwell, chairman of Pergamon, and his family interests, gives Leasco absolute control of the technical and scientific publishing house. Maxwell had already agreed to accept Leasco's offer.

The bid is, however, subject to approval by the Bank of England and the British government.

Goodbody Automates Securities Clearance Operations

NEW YORK — The cage, a major Wall Street back-office operation that has stubbornly resisted automation in the past, is under siege by Goodbody & Co., a large brokerage firm.

Goodbody expects their new automated system, called Autocage, to go far toward reducing the problem of fails — the inability to deliver certificates on time.

Following nearly two years of preparation and testing, Goodbody began using the system last month. When fully installed, by autumn, it should be the first completely automated, securities-clearance system on Wall Street. The cage is a focal area in any brokerage firm, for it is there that securities are received or dispatched.

The computer directs each actual movement of a certificate, and all the accounting entries for

the firm's records are automatically made. This assures not only that certificates will be properly routed, but greatly reduces the possibility of accounting errors. The autocage system at Goodbody utilizes a battery of advanced Bunker-Ramo 2200 Series video terminals linked to the firm's RCA Spectra 70/45. Fifty of the terminals have been ordered, 18 of which have already been installed.

Each of the video terminals is manned by a specially trained operator who can supply information directly to the computer as certificates enter the cage.

The automated system makes all information required for the securities-clearance operation accessible in seconds. In addition, every activity within the cage area is monitored or directed by the computer.

Since details regarding thousands of daily transactions are routinely entered into the Goodbody computer, Autocage has a source from which it constantly ascertains the identity of certificates expected from, or to be delivered to, outside sources.

The computer acts as a policeman, directing all traffic and insuring that no violations occur. For example, if the computer directs that a particular certificate be sent to another broker and the clerical staff does not act upon the instruction within a specified period of time, the computer sends an alarm notification to a supervisor, who can then take corrective action.

Simultaneously, the formation of Goodbody Systems, Inc. was announced. A new computer service organization for the securities industry, it is owned jointly by Goodbody & Co. and a New

York-based computer consultant company that has worked with Goodbody for two years in the creation of the cage project.

Goodbody officials would not give the name of the consulting company, because it currently is involved in a registration of its own securities for sale to the public. *The New York Times* and *The Wall Street Journal*, however, both mentioned Computer Deductions, Inc. as Goodbody's consulting firm. CD was formed recently by a group of former RCA employees.

Pershing & Co., a large New York Stock Exchange member firm, has contracted for the service.

Because of the significance of the new system, Goodbody also presented details to officers of the New York and American Stock Exchanges several weeks ago, and later to the SEC.

Unbundling's Financial Effect on IBM Related to Time

By Ned Chapin

Special to Computerworld

IBM's initial unbundling, announced June 23, reduces most rental and purchase prices about 3% and establishes prices on some services not previously incorporated in the price. The net effect appears to be a price increase. But the timing is critical.

Price reductions on purchased equipment are slightly retroactive. Since leasing companies are the major category of purchaser, this keeps them out of a financial pinch.

In about three months, the rental rate reduction takes effect. This reduction saves money for all IBM's lease customers and those users of IBM equipment on the third-party leases that are tied to IBM's rental rates.

Computers are the equipment items most affected by the rental and price reductions.

Cut Will Cost First

These reductions will cost IBM, with the full impact taking effect in the last two months of 1969 and continuing thereafter. Offsetting this lost revenue will be a gradual increase in revenue,

initially from three sources: systems engineering, field engineering, and custom contract services. Education activities and publications will also contribute some revenue.

In a few years' time, programs will be a major revenue source, probably exceeding the custom contract services.

Systems engineering on a price basis will be gradually phased in, taking full effect by early 1970, this because IBM will first complete most existing work for its customers on the old free basis.

All new work will be on a price basis running from about \$22/hr (unit record, 360/20, and 1130 customers) to about \$35/hr (most multiprogramming, time-sharing, heavy communications, and large computer users, such as 360/65s).

The rate for most medium and medium-large computer users doing batch work will be about \$28/hr.

Pour on the Gravy

These rates will open market opportunities for independent software firms in analysis, design, development, conversion, implementation, and evaluation

work not directly related to IBM's preparation of proposals. Even so, IBM will still retain much of this business, and by the first part of 1970, it alone should be yielding IBM the equivalent of more than 3% its rentals and continue to rise thereafter.

This is gravy, since IBM will need scant additional manpower or facilities to earn this new revenue.

As it gradually assumes and charges for an expanded soft-

ware maintenance function, field engineering will also contribute more revenue.

Part of this function was performed for free by IBM's systems engineering (on type II programs). This will contribute some revenue in 1969 at IBM's \$30/hr rate.

By late 1969, it may be yielding the equivalent of more than 1% of rentals and be rising. Staffing for this expanded function probably will come, in part, from the old systems engineering

personnel.

IBM Can Bid on Packages

Custom contract services, a new function, in general will enable IBM to compete directly with the independent software firms. For years IBM has done so in the government market, but will now expand.

This will enable them to bid on a package basis and be paid for doing systems engineering work it formerly did without charge.

(Continued on Page 22)

TIME DIAGRAM for IBM UNBUNDLING

1969						1970				
Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Free distribution of Type I and Type II programs continues indefinitely										
16	3% purchase price reduction									
23	All IBM distributed programs to be classified									
23	New free system control programs									
23	New program products price phase-in under license									
23	New FE programming assistance on a price basis									
23	New custom contract services on a price basis									
23	Publications on a price basis									
23	System engineering services price phase-in									
23	New education price phase-in period									
				1	3% rental reduction		1	No more SE program maintenance		
							1	Most SE work on a price basis		
							1	Non-sales education now priced		
							1	Planning rearrangements priced		
Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr

Dow Jones Down 3.8%

All Sectors Lose, Leasing - 9.5%

By A.B. Williams
CW Staff Writer

Another tough week. The charts and tables speak for themselves. Not one net gain in the Supplies group (though, as usual, it took the least beating).

The whole market is going down, of course. It's not that computers have stopped selling, or that any other industry projections (except those proclaiming instant earnings) have to be changed.

The chief problem is uncertainty. Added to Vietnam, interest rates, and whatever else (like possible price and wage controls) is hanging over the market, apparently a lot of people have decided that they don't know enough, or in some cases, that they finally do know something.

The two most volatile groups, Leasing and Software, are demonstrating some of this. Leasco finally let everyone know what many already did — that the cost of using someone else's money

in this country has become prohibitive, or at least not worth adding to the inventory risk, best illustrated by the recurrent rumors of new replacements for the 360/30 and 40.

Perhaps Leasco has been smart in developing new areas of competence rather than resting contentedly on their laurels, for however short a time.

The questions in the software part of the industry are becoming clearer at least.

The biggest competitor for any (or nearly any) software house is IBM, which has the capability to produce better software and to price it better (over their entire base of applicable machines) than anyone else.

We'd be tempted to think that the potential winners in the race to compete with IBM will be those companies that do not rush to compete with existing or announced IBM packages.

CW has seen and reviewed some very interesting proprietary packages in the systems-programs area.

It may be a little difficult, however, to find enough users who don't believe that as revisions to their systems packages start to come along, IBM can't (or won't) do a similar job for free.

IBM Financial

(Continued from Page 21)

The personnel for this expanded area will come largely from the old systems engineering function.

By the start of 1970, it should yield IBM the equivalent of better than 1/2% of its rentals and grow thereafter, probably about as fast as the general software market.

Education will begin yielding revenue later in 1969, and by 1970 will be on a price basis for the nonsales-oriented courses. On the price basis, IBM will do less education if software firms step in to offer competition.

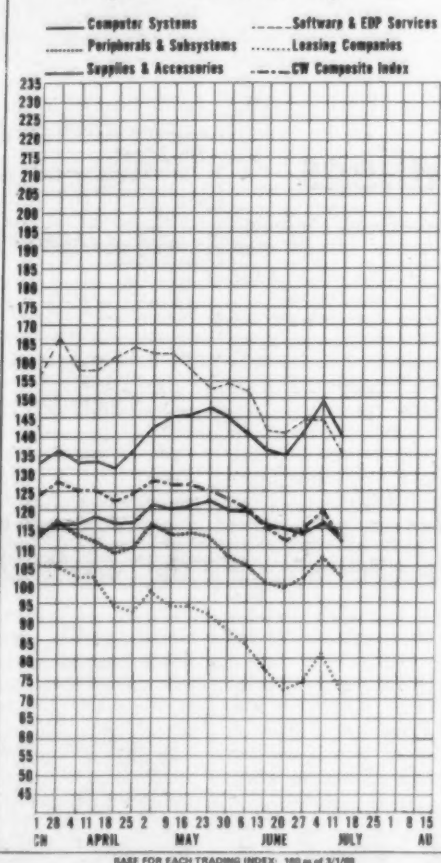
After IBM has had time to adjust its staffing and facilities, its education for non-IBM personnel will pay its own way on an out-of-pocket basis.

Education on a price basis probably will still not be self-supporting even by 1972, since IBM will undoubtedly continue to be its own best customer for its own courses.

Publications will add to IBM's revenue beginning at once. To customers and prospective customers, IBM historically has distributed manuals, reference materials, and forms in reasonable quantities at no charge. Now, outside of direct sales effort, most publications are to be paid for.

In summary, it appears that IBM's announced 3% reductions will be more than offset over a period of time by their other announced price changes. These establish prices for services, programs, and materials formerly provided usually without charge. The overall effect will probably be a strengthening of IBM's financial position.

Computer Stocks Trading Index



Unbundling: What's its impact?

The factual details of IBM's unbundling announcement have been well reported. But what are the key economic impacts on software companies, leasing firms, service bureaus, users, etc? EDP Industry Report's current issue analyzes these impacts, and projects their size and consequence.

EDP Industry Report, "the gray sheet", is generally regarded as the most authoritative source of market facts and figures on the \$12 billion-a-year computer industry. Its twice-a-month issues provide subscribers with facts, ideas and insights on the computer market. Its well-research contents have enabled it to become one of the most-quoted publications in the EDP field.

EDP/IR is published 24 times a year by the International Data Corporation, the largest market data gathering, analysis, and publishing company in the computer and information processing industry. Subscriptions \$75 per year. Free copy of annual Review and Forecast issue sent with pre-paid subscriptions. Write:

EDP Industry Report
Department K
60 Austin Street
Newtonville, Mass. 02160

COMPUTER STOCKS:
TRADING SUMMARY

WEEK ENDED JULY 11, 1969

COMPUTER SYSTEMS					WEEK	WEEK
EXCH	1969	CLOSING			NET	%
	RANGE	PRICE			CHANGE	CHANGE
N	141-120	129 3/4	BURROUGHS CORP	-	11 1/2	-8.14
N	69-44	46 3/4	COLLINS RADIO	+	1/2	1.08
N	159-125	143 3/4	CONTROL DATA CORP	-	9 1/8	-5.97
A	72-61	62	DIGITAL EQUIPMENT	-	8	-11.43
N	25-16	17 1/8	ELECTRONIC ASSOC.	-	1 7/8	-2.87
N	98-84	86 3/8	GENERAL ELECTRIC	-	3 5/8	-4.98
N	95-75	84 1/4	HEWLETT-PACKARD CO	-	2 3/4	-3.16
N	140-107	130 3/8	MONEYWELL INC	-	5 3/8	-8.96
N	354-291	331 1/2	IBM	-	19 3/4	-5.62
N	139-108	130 1/4	NCR	-	1 1/4	-1.95
N	40-38	39 5/8	RCA	-	1 5/8	-3.94
N	50-38	33	RAYTHEON CO	-	2	-6.05
O	43-24	33	SCI. CONTROL CORP.	+	1 1/2	1.54
N	55-44	52 3/8	SPERRY RAND	-	2 1/4	-4.12
A	36-26	32 3/4	SYSTEMS ENG. LABS	-	1 5/8	-4.73

PERIPHERALS & SUBSYSTEMS					WEEK	WEEK
EXCH	1969	CLOSING			NET	%
	RANGE	PRICE			CHANGE	CHANGE
N	82-65	69 1/2	ADDRESSOGRAPH-MULT	-	5 5/8	-7.49
O	71-20	20 1/2	ALPHANUMERIC	-	3 1/4	-13.68
N	44-32	42 1/4	AMPEX CORP	-	1 3/4	-3.98
O	19-11	11 1/2	BOLT, BERANKE & NEW	-	1 1/4	-9.80
N	17-10	11	BUNKER-RAMO	-	1 3/4	-13.73
A	37-25	27 1/2	CALCOMP	-	1	-3.51
O	38-23	23 1/2	COMITRONICS	-	1/2	-2.08
A	16-9	9 7/8	COMPUTER EQUIPMENT	-	1 3/4	-15.05
A	27-13	15 1/2	DATA PRODUCTS CORP	-	1 5/8	-9.49
O	22-13	17 3/4	DIGITRONICS	+	2 3/4	18.33
O	62-46	51 1/2	ELECTRON MEMORIES	-	3	-5.50
O	12-9	9 3/4	FARRI-TEX	+	1/4	2.63
O	37-20	22	FARRINGTON MFG	-	1 3/4	-7.37
O	21-11	11 1/2	INFORMATION DIS	-	1/2	-4.17
A	34-20	23 1/8	MILCO ELECTRONICS	-	2 3/4	-10.63
A	87-59	77 5/8	MOHAWK DATA SCI.	-	9	-10.39
O	118-54	63	OPTICAL SCANNING	-	4	-5.97
O	31-18	18 1/2	PHOTON	-	3	-13.95
A	35-26	26 1/4	POTTER INSTRUMENT	-	2 1/8	-7.49
O	76-54	65	RECOGNITION EQUIP	-	2	-2.99
N	61-27	28 1/8	SANDERS ASSOCIATES	-	3 1/8	-10.00
O	85-39	45	SCAN DATA	+	3	7.14
O	36-17	17 1/2	TALLY CORP.	-	1	-5.41
N	100-85	92 1/8	XEROX CORP	-	7 5/8	-7.64

SUPPLIES & ACCESSORIES					WEEK	WEEK
EXCH	1969	CLOSING			NET	%
	RANGE	PRICE			CHANGE	CHANGE
O	47-32	36	ACME VISIBLE	---	---	---
N	22-12	14 1/4	ADAMS-MILLIS CORP	-	2	-12.31
O	27-23	24 1/2	BALTIMORE BUS FORM	-	1/4	-1.01
A	29-18	19 1/2	BARRY WRIGHT	-	1 7/8	-8.77
O	44-29	29 3/4	DATA DOCUMENTS	-	1 3/4	-5.56
N	42-34	34 3/4	ENNIS BUS. FORMS	-	1/4	-1.71
N	89-65	83 1/2	MEMOREX	-	2 1/2	-2.91
N	112-94	102 1/8	3M COMPANY	-	2 3/4	-2.62
O	37-29	31 3/4	MOORE BUS FORMS	-	1	-3.05
N	46-36	39 7/8	NASHUA CORP.	-	2 1/8	-5.06
O	48-33	33	REYNOLDS & REYNOLD	-	3	-8.33
O	31-23	27	STANDARD REGISTER	-	1 1/2	-5.26
N	36-28	33 1/2	UARGO	-	1 1/4	-3.68
A	20-13	14 1/2	VARIABLE MAGNETICS	-	1/4	-1.69
O	34-29	32 1/4	WALLACE BUS FORMS	---	---	---

SOFTWARE & EDP SERVICES					WEEK	WEEK
EXCH	1969	CLOSING			NET	%
	RANGE	PRICE			CHANGE	CHANGE
O	14-7	7 1/4	ADVANCED COMP TECH	-	1/2	-6.45
O	39-29	34	APPLIED DATA RES	+	1 1/2	4.62
O	19-7	7 1/2	ARIES	-	1/2	-6.25
A	83-63	77 1/8	AUTOMATIC DATA PROC	-	7/8	-1.12
O	13-7	8 1/2	AUTO SCIENCES	---	---	---
O	17-10	10 3/4	BRANDON APPL SYS	---	---	---
A	21-13	13 3/4	COMPUTER APPL	-	5/8	-4.35
O	16-7	7 1/2	COMPUTER ENVIRON	-	1/4	-3.23
O	47-27	31	COMPUTER NETWORK	---	---	---
N	30-24	26	COMPUTER SCIENCES	-	4	-13.33
O	40-16	16 1/2	COMPUTER USAGE	-	1/2	-2.94
A	56-37	45	COMPUTING & SOFT	-	2 1/2	-5.26
O	24-8	8 1/4	DATAMATION SERVICE	-	1	-10.81
O	17-8	9	DATATAR	-	1/2	-5.26
O	15-6	8 1/4	DIGITEK	+	1/4	3.13
A	38-20	22 1/4	ELECT COMP PROG	-	1 3/8	-5.82
O	30-20	21 3/4	INFORMATICS	-	3	-12.12
O	19-3	3 1/2	MATRIX CORP.	-	1/2	-12.50
O	22-9	9	NAT COMP ANALYSTS	-	1	-10.00
A	33-23	28 5/8	PLANNING RESEARCH	-	1 3/8	-4.58
O	11-7	8 1/4	PROGRAMMING & SYS	+	1/4	3.13
O	10-6	8 1/2	SOFTWARE SYSTEMS	+	3/4	9.68
O	37-6	6 1/2	STRATEGIC SYS	-	1	-13.33
O	36-11	22 1/2	TBS COMP CENT INC.	-	3	-11.76
O	12-5	5 1/2	UNITED DATA CENTER	-	1/4	-4.35
O	155-68	69	UNIVERSITY COMP	-	6	-8.00
O	38-22	22 1/2	URS SYSTEMS	-	3 3/4	-14.29
O	16-9	9 1/4	U.S. TIME-SHARING	---	---	---

LEASING COMPANIES					WEEK	WEEK
EXCH	1969	CLOSING			NET	%
	RANGE	PRICE			CHANGE	CHANGE
O	45-25	30	BOOTH COMPUTER	+	1 1/2	5.26
O	18-6	6 1/2	COMPUTER EXCHANGE	-	1/2	-7.14
A	34-12	12 1/2	COMPUTER LEASING	-	2 1/4	-15.25
O	14-8	12 7/8	CON COMPUTER	-	1/8	-9.6
O	12-8	9 1/2	CYBER-TRONICS	+	3/4	8.57
A	68-31	32	DATA PROC. F & G	-	5 1/2	-14.67
O	16-7	7	DATRONIC RENTAL	-	1/4	-3.45
A	52-36	41	DEARBORN COMPUTER	-	1 7/8	-4.37
O	16-10	11 1/4	DPA, INC.	-	3/8	-3.23
A	45-25	26 3/8	GRANITE EQUIPMENT	-	2	-7.05
A	28-14	15 7/8	GREYHOUND COMPUTER	-	2 5/8	-14.19
N	139-28	29 1/8	LEASCO DATA PROC.	-	5 3/8	-15.58
O	9-5	5	LECTRO COMP LEAS	-	1/4	-4.76
A	57-27	29 3/8	LEVIN-TOWNSEND CMP	-	3 3/8	-10.31
O	8-4	4 3/4	LHC DATA, INC.	---	---	---
O	14-5	5 3/4	MANAGEMENT ASSIST	-	5/8	-9.09
A	39-27	28	NATIONAL EQUIPMENT	-	3 1/2	-11.11
O	12-6	7	NCC LEASING	+	1/4	3.70
A	43-22	23 1/4	RANDOLPH COMPUTER	-	3	-11.43
O	34-9	9	SYSTEM CAPITAL	-	1/4	-2.70
A	28-13	15 3/4	U.S. LEASING	-	2 1/2	-13.33

Earnings Reports

NORTH AMERICAN PHILIPS CORP.

3 Months Ended March 31

	1969	a1968
Rev	\$122,382,000	\$117,610,000
Earnings	4,194,000	3,965,000
bShr Ernd	.49	.46
cShr Ernd	.47	.44

a—Restated to give effect to acquisition of North American Philips Co., Inc. accounted for as a pooling-of-interest. b—Before extraordinary item of .02. c—Before extraordinary item of .02, and assuming conversion of subordinated convertible debentures. 1968 Provision for federal income taxes restated to reflect surtax.

TECHNITROL, INC.

3 Months Ended March 31

	1969	1968
Revenue	\$2,970,078	\$2,260,085
Earnings	88,664	(58,910)
(loss)		
Shr Ernd	.06	(.04)

INTERNATIONAL COMPUTER SCIENCES, INC.

9 Months Ended March 31

	a1969
Revenue	\$1,037,757
Earnings	237,248
Other	85,526

Inco-Net

Shr Ernd .236

6 Months Ended Dec. 31

	a1968
Revenue	\$619,341
Earnings	166,358
Other	103,018

Inco-Net

Shr Ernd .167

a—Unaudited.

MOHAWK DATA SCIENCES

3 Months Ended April 30

	1969	a1968
Revenue	\$23,845,000	\$14,450,000
bEarnings	2,230,000	555,000
bShr Ernd	.41	c.10

9 Months Ended April 30

	1969	a1968
Revenue	\$59,575,000	\$37,030,000
bEarnings	4,745,000	1,720,000
bShr Ernd	.87	c.33

a—Restated to include operations of companies acquired during fiscal 1968 on a pooling-of-interest basis; b—Includes tax credits of \$100,000, or 2 cents a share, in the quarter and \$400,000, or 7 cents a share, in the nine months, compared with \$335,000, or 6 cents a share, and \$750,000, or 14 cents a share, respectively, in the like 1968 periods from utilization of tax-loss carry-forwards; c—Adjusted for two-for-one stock split in July, 1968.

LEVIN-TOWNSEND SERVICE

Year Ended March 31

	1969	a1968
Gross Revs	\$7,422,000	\$4,933,000
Net Aft Tax	159,000	b83,000
cProfit	541,000	543,000
Earnings	700,000	460,000
dShr Ernd	.50	.34

a—Restated to give effect to the acquisition of Russell M. Tolley & Associates, Inc. in Oct. 1968, on a pooling-of-interests basis; b—Loss; c—From sale of affiliated and unaffiliated companies net of cost and applicable income taxes; d—On a fully diluted basis.

LMC DATA, INC.

Year Ended Feb. 28

	1969	a1968
Revenue	\$4,012,590	\$3,605,775
Earnings	(32,389)	131,686
(loss)		
Shr Ernd		.13

a—Adjusted by company to reflect acquisitions on a pooling-of-interests basis.

MANAGEMENT ASSISTANCE, INC.

3 Months Ended March 31

	1969	1968
Revenue	\$18,824,732	\$16,163,480
Loss	194,928	18,678,453
Spec Chg		a17,000,000

6 Months Ended March 31

	1969	1968
Revenue	\$36,382,790	\$32,466,793
Loss Bf Tax	231,823	2,175,929
Inc Tax	280,000	b154,000
Loss	511,823	19,021,929
Spec Chg		a17,000,000

a—Represents, for the most part, a provision, equivalent to the book value of data processing equipment, off rent, and in excess of estimated current requirements; b—Credit.

UNIMED, INC.

6 Months Ended March 31

	1969	1968
Revenue	\$439,063	\$368,632
Loss	96,273	150,142

PROGRAMMING SCIENCES CORP.

3 Months Ended Feb. 28

	1969	1968
Revenue	\$611,773	\$213,227
Earnings	40,587	(6,823)
(loss)		
Shr Ernd	.04	

Year Ended Nov. 30

	1968	1967
Revenue	\$1,250,037	
Loss	507,794	

SCIENTIFIC RESOURCES

6 Months Ended March 31

	1969	a1968
Revenue	\$21,468,250	\$8,528,788
Earnings	272,075	(1,624,341)
(loss)		

a—Restated to reflect the disposition of certain mortgage service activities and the acquisitions of Mauchly Associates, Inc. and Nuclear Associates International Corp. No calculations made for common share earnings; preferred dividend requirements exceeded net income.

MANAGEMENT DATA CORP.

Year Ended Feb. 28

	1969	1968
Revenue	\$5,035,672	\$2,807,808
Earnings	448,558	a339,263
Shr Ernd	b.54	c.50
Tax Credit		76,000

a—Equal to 64 cents a share; b—Assuming full convertibility; c—Based on income before tax credit.

GRANITE LEASING

Year Ended Feb. 28

	1969	a1968
Oper Rev	\$17,333,000	\$7,964,000
Earnings	1,665,000	b1,098,000
cShr Ernd	1.05	d.70
Spec Credit		e169,000

a—Restated by company to reflect acquisitions on a pooling-of-interests basis; b—Equal to 82 cents a share; c—Based on income before special credit; d—Adjusted to reflect four-for-three stock split in July, 1968; e—From tax loss carry-forward and sale of securities.

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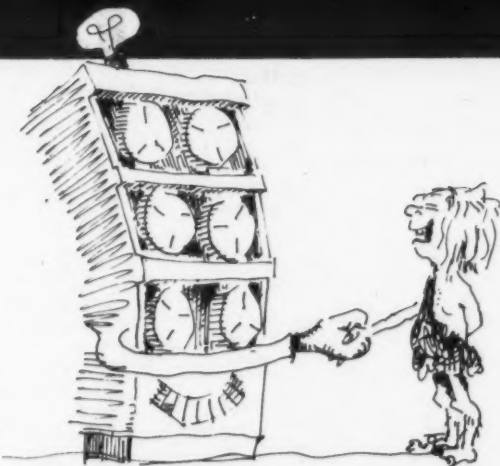
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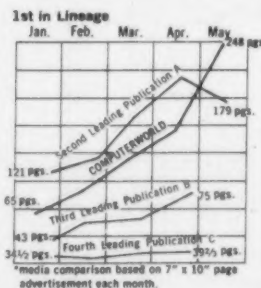
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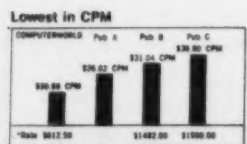
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COMPUTERWORLD

CDC Picks Mid-West for Peripheral Plant

RAPID CITY, S.D. — Control Data Corp. will establish a major computer-peripheral manufacturing operation here, according to an announcement made by Thomas G. Kamp, group vice-president of Control Data's peripheral products and computer manufacturing group.

Kamp said that Control Data had acquired 130 acres of land and that construction of a 40,000-sq-ft plant would begin immediately, with completion scheduled for Jan. 1, 1970.

Employment at the Rapid City operations will initially total around 200-300 people, with expansion anticipated in future years. Recruiting and training of the first group of employees for the plant will begin in November, 1969, Kamp said.

Initially, he said that the Rapid City operations would produce electronic assemblies and subassemblies, wiring harnesses, power supplies, logic chasses, and printed-circuit board assemblies. These will be shipped to the company's Normandale division in Minneapolis for installation in peripheral products presently being produced at that plant.

However, to relieve the expansion burden at Normandale, Kamp said that within a year of

beginning manufacturing operations in Rapid City, the plant will be producing completed peripheral products for use in Control Data's computer systems.

RCA Plans Third Regional Internal EDP Center

CHERRY HILL, N.J. — The third in a planned network of regional information systems centers to handle internal data processing requirements has been planned by RCA.

The Cherry Hill center, like its counterparts in New York and Los Angeles, will provide an efficient computer system and

time-sharing capability.

The planned network of regional centers will provide an economical means of implementing RCA's management information systems program, designed to make immediately available that data which each level of RCA management needs for its planning and decision-making, the company says.

He said the initial equipment at the South Jersey Center will consist of two Spectra 70/45s and two Spectra 70/46 time-sharing systems. The center's system will be expanded to include new RCA computers, such as the recently announced, large-scale Spectra 70/60.

Informatics Signs 15-Year Lease on 22,000-Sq-Ft Area

RIVER EDGE, N.J. — The Northeast division headquarters of Informatics, Inc. has signed a 15-year lease on a new 22,000-sq-ft facility in River Edge. The Northeast division is currently involved in major computer system projects for banks and brokerage firms in the New York area.

Univac Expands Software Development in Utah Area

SALT LAKE CITY, Utah — Univac has expanded its software development activities with the establishment of a new systems programming location to augment systems programming work presently being performed in Roseville, Minn., and Philadelphia. The primary function of the Salt Lake City operation will be the development of new software for advanced Univac computer systems with special emphasis on communications-oriented software.

Other Recent Moves

- Computer Learning and Systems Corp. has opened its New York office at 2 Penn Plaza, headed by Earl J. Frawley, marketing manager. The Computer Learning and Systems facility will market Case computer proprietary software packages, custom computer education, and consulting services in the Northeast.
- The defense systems division of the Bunker-Ramo Corp. has established an engineering office at 15-1/2 A Main St., Fairborn, Ohio, to house the technical staff assigned to the control, display, and reconnaissance programs at Wright-Patterson Air Force Base.
- Analysis & Programming Corp.

has opened an office at 7600 Georgia Ave. N.W., Washington, D.C. APC provides consulting, analytical, and programming services to both the federal government and industry.

• Periphery, Inc. and Computer Model Co., divisions of Computer-Link Corp., have moved their sales and manufacturing facilities to 58 Guinan St., P.O. Box 373, Waltham, Mass. Periphery manufactures keypunch silencers, forms splicers, forms stacking trays, and low-cost manual keypunches, while Computer Model offers 3-D scale computer models for layout planning.

• Keystone Computer Associates, Inc. a subsidiary of University Computing Co., specializing in computer programming and systems analysis, has moved to its new 11,000-sq-ft corporate office building located at 1055 Virginia Drive, Ft. Washington, Pa.

• Burlington Management Services Co. is opening a branch office in Burlington House, 1345 Avenue of the Americas, New York, to link customers with BMSC's computer center in Greensboro, N.C. Thomas N. Ruth of Princeton, N.J., a BMSC associate, heads the operation.

• Executive Computer Systems, Inc., a data processing consultant firm, is expanding its operations with the opening of a sales office at 731 N. Jackson, Milwaukee, Wis. It will be headed by G.R. Treseder, general manager for ECS.

• General Automation, Inc. has acquired a 20,000-sq-ft manufacturing facility at 1632 State College Blvd., Anaheim, Calif., to complement the company's existing Orange, Calif., facility.

• Information International has opened an office at 7800 Coolidge Drive, Camp Springs, Md. The company manufactures, and markets computer-controlled, visual-image processing systems for industrial, government, and research applications.

• International Computer Corp. has opened an office at 2000 L St., Washington, D.C., to be headed by Morton C. Tuckman, president of ICC of Washington, Inc., a wholly owned subsidiary of ICC and a vice-president of ICC's software division.

• Systemation, Inc. will break ground for a new three-story office building located on 8th St., Colorado Springs, Colo., that will provide education and training programs on administrative systems.

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Nasa Awards Possible \$5 Million Contract

SILVER SPRING, Md. — The information sciences division of Computer Applications Inc. has been awarded two contracts with a ceiling value of \$5 million by the Nasa Goddard Space Flight Center, Greenbelt, Md.

The contracts call for off-site computer analyses and programming services for a three-year period in the areas of ground systems, operations satellite control, and scientific data processing.

Computer Applications has been performing similar tasks at the Nasa Goddard Space Flight Center since having been awarded its original contract in 1964. Systems that have been designed and implemented by Computer Applications' staff in support of Goddard include a real-time system for project Apollo, telemetry data reduction, attitude determination, and satellite control systems for projects such as OAO, Nimbus, Bios, ATS, OGO, OSO, and other manned and unmanned projects relevant to the scientific space program.

Computer Applications has leased and staffed a three-story building near Greenbelt to service its Nasa contracts.

URS Systems of San Mateo, Calif., is conducting negotiations with the Army's Mobility Equipment Research & Development Center, Fort Belvoir, Va., on behalf of the U.S. Army Computer Systems Command for continued work on computerized supply, personnel and administration, and medical information systems for Army field use at division and corps levels.

Ampex Corp. has received a \$350,000 contract from General Computer Systems, Inc. of Dallas for 100 Model TMZ digital tape memories. The computer-class TMZs will be incorporated in new keyboard-to-magnetic tape systems that General Computer Systems will manufacture and market. The new system is designed for use in central data processing facilities.

Gregory Fossella Associates of Boston has been retained by International Data Sciences, Inc. of Providence, R.I., to design data processing equipment and to develop and implement a major corporate identification program. Creation of a new, space-age look for computer equipment represents most of the assignment.

International Petrodata, Inc. of Calgary, specialists in computer applications, has signed a \$1,200,000 long-range contract to design, build, and implement a highly sophisticated data information system for Sonatrach, the government-owned Algerian oil company. The system will utilize the most advanced techniques in information science, and IPI will train Sonatrach personnel to operate and maintain the system.

Hartman Systems Co., Inc. of Huntington Station, N.Y., has been awarded a \$1,836,000 contract by the Naval Ship Systems Command, Washington, D.C., to design and manufacture 51 NC-2 Model 3 plotting systems to be used aboard destroyers, de-

Contracts

stroyer escorts, cruisers, aircraft carriers, and other naval ships for navigational and antisubmarine warfare operations.

Award of a \$1,263,611 contract to the Sylvania electronic systems division, Needham Heights, Mass., has been made by the Air Force electronic systems division, Hanscom Field, Mass. The contract is for modem depot maintenance for the joint service Tactical Satellite Communications Program. Under the contract, modems requiring maintenance during the present testing program will be shipped to Sylvania for the necessary repairs.

Data Disc, Inc., Palo Alto, Calif., has received a \$1.2-million contract from Scientific Control Corp., Dallas, to build 7200 Series disk-memory systems and memory controllers for the SCC 4700 computer. The 7200 Series memories include four models with data capacities up to 6.4 million bits.

Data Products Corp. has been awarded a \$672,000 contract for the development and initial production of militarized teleprinters for the Naval Electronics Laboratory Center, San Diego, Calif. The teleprinters are one module of the advanced user-terminal family of equipment that will be used initially in the Navy message-processing and distribution systems.

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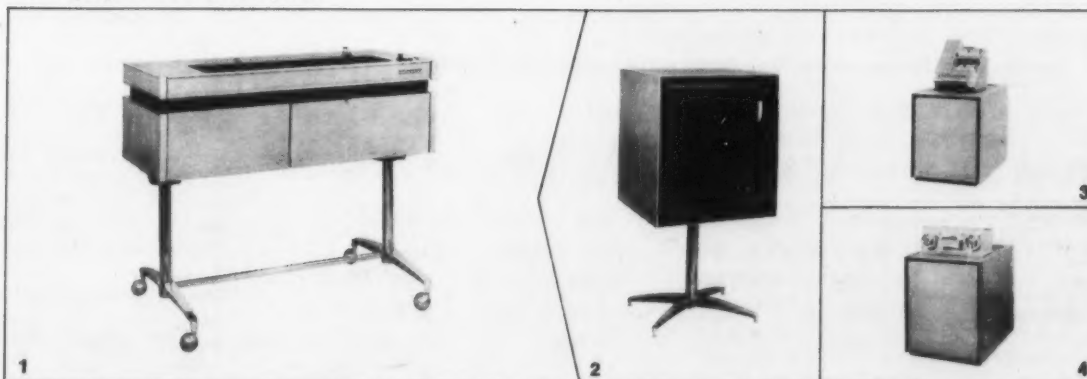
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Cyrus R. Vance Elected to IBM's Board, Buckner Resigns for Other Interests

ARMONK, N.Y. — Cyrus R. Vance, a partner in the New York law firm of Simpson, Thacher & Bartlett and former government official, has been elected to the board of directors of IBM.

He succeeds Walker G. Buckner, who has resigned from the IBM board in order to meet the increasing requirements of his other business interests. He has served on the board since 1955.

Vance returned to his law practice in February, after having served for one year as one of the two U.S. negotiators at the Vietnam peace talks in Paris.

The new IBM board member became general counsel for the Department of Defense in 1961. He was appointed secretary of the Army in 1962 and was deputy secretary of defense from 1964 to 1967. In 1967 and 1968 he served as special representative of the President in the Cyprus crisis and in Korea.

Having served as assistant to the president of Mead Corp., Vance joined Simpson, Thacher & Bartlett in 1947. He became a partner in 1956.

Vance, who is admitted to practice before the U.S. Supreme Court, is a Fellow of the American College of Trial Lawyers and a member of the American and New York City Bar Associations.

He is a graduate of Yale University and of Yale Law School.

Mr. and Mrs. Vance and their five children live in New York City.



Cyrus R. Vance

Executive Corner

Boothe President Elected To Comterm Board

SAN FRANCISCO — Paul Williams Jr., president of Boothe Computer Corp., has been elected chairman of the board of directors of Comterm Corp., Phoenix.

Boothe Computer Investment Corp., a subsidiary of Boothe Computer, has a significant investment in Comterm, manufacturers of computer peripheral equipment.

Organized earlier this year, Comterm is working in the areas of CRT keyboard type arrangements, acoustical couplings, and data set equivalents.

Williams has been president of Boothe Computer since its founding in 1967. Previously he was senior vice-president of GC Computer Corp. and a long-time executive with IBM in several cities.



Paul Williams Jr.



Thomas S. McFee

and taught in the Montgomery County, Md., schools before joining the government.

McFee Becomes Secretary For HEW Program Systems

WASHINGTON, D.C. — Secretary of Health, Education and Welfare Robert H. Finch has appointed Thomas S. McFee as deputy assistant secretary for planning and evaluation of program systems.

For the past two years, McFee, a 38-year-old native of Milwaukee, has been HEW's director of systems development. He was responsible for the design and implementation of the program systems to support planning, programming, and budgeting in the department.

In his new role he will be responsible for the coordination of long-range planning and the development of program information systems designed to measure the effects of HEW programs.

Prior to joining HEW, McFee served on the staff of the White House Office of Science and Technology and for four years was a member of the Department of Defense Weapons Systems Evaluation Group.

A graduate of the University of Maryland in 1953, McFee served as an officer in the Air Force

Other New Appointments

□ John H. Scofield and Martin Seldeen have been elected to the Statcom, Inc. board of directors, Fairfax, Va.

□ William J. McLaughlin has been elected president of the National Computer Institute, Wayne, Pa.

□ Robert L. Thaler has been elected chairman of the board of Growth Industry Computing, Inc., Los Angeles.

□ Dr. Arthur Kantrowitz has been elected to the board of Cambridge Computer Associates, Inc., Cambridge, Mass.

□ Michael F. Nolan has been named president of Information Systems Co., a division of DPF&G in Los Angeles.

□ Joseph P. Driscoll has been elected chairman of the board of Computer Complex, Inc., Houston.

□ Joseph C. Vierra has been elected a vice-president and member of the board of directors of Analysis and Programming Corp., Greenwich, Conn.

□ Herbert B. Rosenheck has been elected to the board of directors and appointed corporate vice-president of the Data-station Corp., Los Angeles. (P)

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Aquisitions

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Greyhound Computer Corp. of Chicago has agreed to purchase **Data Architects, Inc.**'s interest in the Greyhound Time-Sharing Corp. for an undisclosed sum.

Computer Controls Corp. of Miami, Fla., a company engaged

in time-sharing and the design and development of computer programs and systems, has completed the acquisition of **Computer Languages Corp.** of Jacksonville, Fla., a private school that teaches computer time-sharing, for an undisclosed amount of cash.

Sales Follow-Up Corp. has entered into an agreement with all the stockholders of **Computer Profile Marketing, Inc.** for the exchange of all Computer Profile Marketing, Inc. stock for common stock of Sales Follow-Up Corp. The total purchase price is in excess of \$3,000,000. Sales Follow-Up is involved with computer-generated communications systems, while Computer Profile Marketing, Inc., New York, is engaged in the construction of

data banks and uses data stored therein to automate sales and sales communications.

Arcata National Corp. and **Atlantic Microfilm Corp.**, Spring Valley, N.Y., have announced the execution of a definitive agreement whereby Atlantic will be merged into Arcata. Primary activities of Arcata include providing information processing services to the aviation industry and printing services. Under the terms of the merger agreement, each common share of Atlantic will be exchanged for 0.4 common share of Arcata National. About 230,000 Arcata common shares will be issued. The merger has been approved by both boards of directors, and is now subject to the favorable vote of Atlantic shareholders.

New Registrations

COMPUSAMP, INC., 405 Lexington Ave., New York, N.Y. 10017, a company that provides marketing services, market-research services, computer analysis of market data, and other related services, filed to register 200,000 shares of common stock. Proceeds, at \$5 per share, intended to establish a regional warehouse, assembly, and distribution facility; to finance an expanded sales and advertising program; to finance development of proprietary computer programs to be used in conjunction with marketing and market-research services; and to use in connection with its Panel-Pak programs. The underwriter is A.T. Brod & Co., 200 Park Ave., New York, N.Y.

ACCESS CORP., 4632 Paddock Road, Cincinnati, Ohio 45229, a company engaged in the design, development, manufacture, and lease of systems to provide information control for use by corporations, banks, retailers, universities, hospitals, and other institutions, filed to register 140,182 shares of common stock, of which 10,000 are being offered as a secondary distribution, and the rest are being reserved for fulfillment of options. No underwriter is involved.

ARTHUR S. KRANZLEY AND CO., INC., 383 Kings Highway, Cherry Hill, N.J. 08034, a company engaged in management consulting principally related to electronic data processing systems and product and market-planning studies, filed to register 100,000 shares of common stock. Proceeds, at \$11 per share maximum, intended to finance the development, equipping, and initial operation of an electronic data processing center for its systems-management services, and to develop and acquire additional programmed systems and improve existing systems. The underwriter is Drexel Harriman Ripley, Inc., 60 Broad St., New York, N.Y.

COMPUTRONICS, INC., 234 N. Broadway, Milwaukee, Wis. 53202, a company engaged in manufacturing, assembling, and designing precision electronic equipment primarily for defense and military use under government contracts, filed to register 130,000 shares of common stock. Proceeds, at \$6 per share maximum, intended for addition to the company's general funds. The underwriter is Havener Securities Corp., 111 Broadway, New York, N.Y.



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